Radio Control A NEW BREED OF SEDAN Best performance ever 47380 THE WORLD'S LEADING R/C CAR MAG April 1999



TRAXXAS NITRO 4-TEC

ALSO RTR

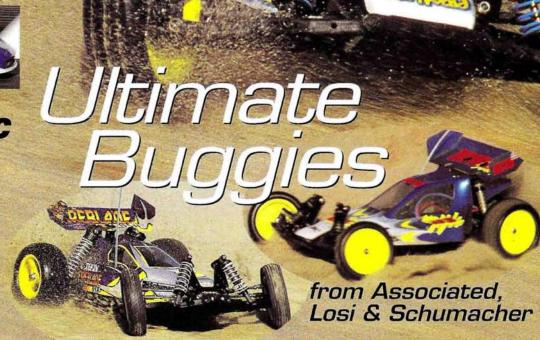
DURATRAX **MAXIMUM ST**

HPI

NITRO RS4

PLUS

How to get from box to backyard



ROBITRONICS

ALSO TESTED

TAMIYA ВАЈА СНАМР **УОКОМО** YR4 PRO 2

OFNA **PIRATE 10 EVOLUTION**





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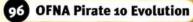
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ON THE COVER: Team Losi XX 'CR' Kinwald Edition; Traxxas Nitro 4-TEC; Associated RC10B3; Schumacher Fireblade Special Edition; screen shot generated by the Robitronic Pro Master Dyno. All photos by Walter Sidas.

Nitro R/C is easier than ever!

ho wouldn't agree? There are now many well-built, nitro-powered,

ready-to-run kits on the shelves that will get you from hobby shop to vacant lot or racetrack in record time. This month, we devote our attention to three RTR kits: the HPI RTR Nitro RS4 (HPI's first RTR!). Traxxas Nitro 4-TEC (does it really go 50mph?), and **DuraTrax Maximum ST** (complete with painted body and AA batteries!). Three companies, three philosophies on what makes the best ready-to-run pack-



age. Of course, the final decision comes from the industry's ultimate power broker: you!



The antithesis of "ready-to-run" is "homebuilt," and we have what might be the wildest rig ever. Sure, Kevin Hetmanski's **Homebuilt: FirePower** Monster Truck looks cool, has lots of pretty parts,

blah, blah, but here's the best part: it shoots fire out of its header pipes. Your truck can climb anything? Big deal. Kevin's can roast marshmallows!

If it's racing that gets your blood flowin', we have a couple of articles that will be sure to please. For you off-road guys, the 2WD Electric

Racing Buggy Guide will allow you to compare notes on the Associated B3, the Team Losi XX 'CR' Kinwald Edition and the Schumacher Fireblade USA Special Edition. Everybody has an opinion on who makes the best buggy; do we share yours?



Let's talk on-road. Ask anyone what "touring car" (TC) means in R/C, and they'll always include "4WD" and "independent suspension" as part of the



equation. Get ready, because that equation is changing. Take an up-close look at a new vehicle class that could revolutionize the TC scene in **Direct Drive Touring:**

the shape of things to come?will

DDTCs become a fixture in TC racing? Associated and Corally are betting yes. Until next month—read the instructions twice, and good luck finding that E-clip!

Peter Vieira

Editor



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READERS WRITE



Purple Bennett Chassis?

I noticed that Kevin Hetmanski's truck has a purple Bennett chassis (I saw it in the NR/CTPA Worlds article). Does Bennett offer the kit in colors? ADAM KOTO Syracuse, NY

No; Kevin sent his chassis out for color; get all the details in this issue's "Homebuilt" article; it features Kevin's creation, highly modified after its Worlds appearance! Nice timing, huh?

-Pete

Speed Fix

I have just purchased an electric Stampede that I am very pleased with. I am new to R/C, and I would like as much info as possible on how to make my Stampede go faster. Which parts do I need? Motor? Transmission? Gears? [email] DAN RYE

The simplest way to increase speed is to install a faster motor. Machine-wound modified motors are relatively inexpensive (\$30 to \$40). Trinity's Gem series machine mods are popular and easy to find. Try the Sapphire; it's a 17 single that should boost top speed yet still offer enough torque to keep those big tires turnin'. For the best results with the new motor, install a pinion that is one tooth smaller than stock. This will help the transmission make better use of the Sapphire's higher rpm. -Pete

Believe the Pipe

I plan to buy an HPI Nitro RS4
Mini, and I want to install a tuned
pipe. I've been reading articles
about tuned pipes in your mag for
a while and understand they
benefit an engine's performance
and longevity. Is there a pipe
available for Minis, or will I have
to stick with the supplied canister
type? [email]
SEAN McDONALD

Sean, we're glad you're following our advice. Because the Nitro Mini is so narrow, it's hard to install a pipe and manifold in it without having them interfere with the body. According to HPI, the new muffler system for the RTR cars will also fit the Mini. Although it is not a true tuned pipe, it will allow the engine to breathe better, and it will improve performance.

— Greq

TF-2 Questions

I bought a TF-2 Type R about a year ago. At the time, I thought it was the best car on four wheels, and many of my friends were equally impressed. Why don't I see more of them? I never see it in any race results. Is there something wrong with the car that I'm not seeing, or is it as good as I think it is? [email] CARLOS CASTRO

You're not wrong; the Kyosho TF-2 Type R is impressive. When it first came out, I tried one and found it nimble on the track. Editor Peter Vieira just reviewed its successor, the TF-3 Type R, and found it a capable racer. When you check out this month's "Inside Scoop," you'll see a further refined "99" version of the car.

So why aren't you seeing them in the winners' circle? It isn't because the car isn't a competent performer. Kyosho doesn't sponsor drivers; that's a biggie. Also, not all hobby stores are Kyosho dealers, and racers run the cars that the local shop carries parts for. Your Type R won't hold you back, so race it with confidence. If you're good enough to win races, you'll probably see other drivers switch to Kyosho in an effort to match your performance. —Greg

This Motor's a Gem

I have an RC10T3, and my friend just gave me a Trinity Jade 15-turn quad modified motor, but I am missing a brush for it, and my dealer is out of them. Do you know where I can get one? Another question: I have a Novak ESC, but I'm not sure whether I can run the 15-turn mod with it. It is only supposed to go up to a 19-turn motor, but with the right gearing, I think I can run it. Can you recommend a gear setting for me? JASON OELTJEN Victoria, TX

Jason, do you have another openendbell motor hanging around? You can steal the brushes from it to get your Jade on line. If that isn't an option, you could mailorder the brushes, but you would probably pay more for the shipping than you would for the brushes themselves! Based on the motor limit you mention, I'll assume that you have an older Novak ESC; the specs listed on Novak's website (www.teamnovak.com) don't list a 19-turn limit for any model; however, my experience has been that manufacturer motor limits tend to be conservative and assume the user is, well, a hack. Assuming your truck still has the 87-tooth stock spur gear, a 19-tooth pinion should be a safe bet. That's a 4.58:1 ratio between

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

INTERNET ADDRESSES:

Chris Chianelli: chrisc@airage.com. George Gonzalez: georgeg@airage.com Steve Pond: stevep@airage.com Peter Vieira: peterv@airage.com Greg Vogel: gregv@airage.com

pinion and spur. If you aren't using the stock spur, just divide the number of teeth on the gear by 4.58, then round to the nearest number; use the result as your pinion size. Let's say you have a 100-tooth spur; 100 ÷ 4.58 = 21.83. Round to the nearest whole number, and you have your pinion size: 22 tooth. —Pete

Tough Choice

Hey, just let me say your magazine rules. I have a small dilemma: I want a new off-road buggy or truck, but I can't choose between a XX-T 'CR' Graphite Plus and a XX 'CR' Kinwald Edition. I want a fast, tough and durable on- and off-road truck or buggy. Which one should I get? BILLY Aloha, OR

Well Billinator, it looks like you've got taste! Since you've picked Losi's absolute best offroad vehicles, you can rest assured they will be "fast, tough and durable." However, the on-road/off-road requirement you mention could be a problem. If you run either vehicle on pavement, you'll quickly ruin the soft knobby tires. Also, dedicated offroaders tend to handle poorly on pavement-too much soft suspension. If that doesn't matter to you, the next question is: truck or buggy? Trucks can handle rough stuff and big jumps better, thanks to their wide tracks, longtravel suspensions and large tires. Buggies tend to be faster and corner better than heavier trucks, but they don't like really gnarly terrain. Neither vehicle is the "wrong" choice, but one will be more right for you. -Pete ■

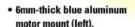
Kyosho unveils TF-3 Type R '99

Kyosho's commitment to the Touring Force line is evidenced by the new Type R '99, which sports some important revisions for the last year before the planet blows up:

- · Center one-way pulley and front one-way diff.
- · "Hard"graphite-reinforced suspension arms.
- New front hub carriers have less offset, allowing the use of outer holes in the suspension arm while maintaining 190mm width.



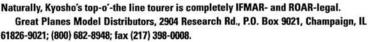




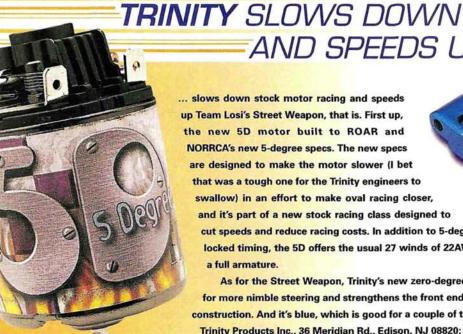
 Redesigned chassis features a separate, bolt-on steering servo plate that reduces flex for better handling (lower left).

... plus the usual Type R features: adjustable tie rods, front universal swing shafts, a 94-tooth 48-pitch spur gear and 32-tooth 48-pitch pinion gear, built-in transponder mount and full ball bearings.

Naturally, Kyosho's top-o'-the line tourer is completely IFMAR- and ROAR-legal.



AND SPEEDS UP ...



... slows down stock motor racing and speeds up Team Losi's Street Weapon, that is. First up, the new 5D motor built to ROAR and NORRCA's new 5-degree specs. The new specs are designed to make the motor slower (I bet that was a tough one for the Trinity engineers to swallow) in an effort to make oval racing closer, and it's part of a new stock racing class designed to cut speeds and reduce racing costs. In addition to 5-degree locked timing, the 5D offers the usual 27 winds of 22AWG wire, stand-up brushes and

As for the Street Weapon, Trinity's new zero-degree front bulkhead reduces caster for more nimble steering and strengthens the front end thanks to machined-aluminum construction. And it's blue, which is good for a couple of tenths off every lap.

Trinity Products Inc., 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600;

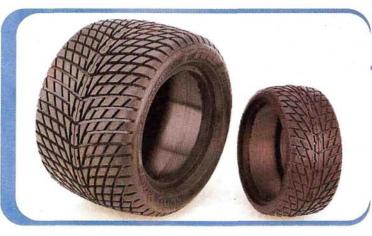
fax (732) 635-1640; website: www.teamtrinity.com.

Silicone—silicone—silicone!

Be it tubing, wiring, coupling, extending, retaining, or enlarging (oops!)—General Silicone Co.'s R/C division is there for all your silicone needs, and it brings them to you in bright colors, too. Now you can finish off that all-hot-pink buggy you've been building!

General Silicone Co. Inc., 650 W. Duarte Rd., Ste. 205, Arcadia, CA 91007; (626) 445-6036; fax (626) 445-6084.

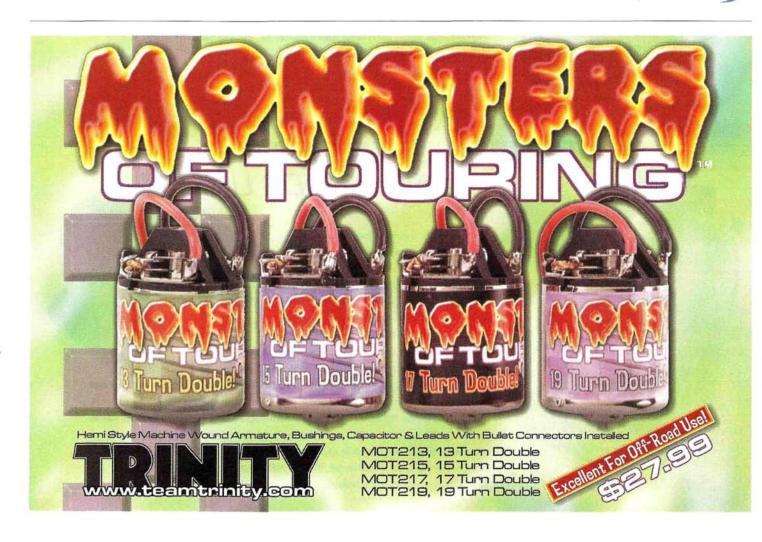




The Rage rolls on

Pro-Line introduces its new Road Rage treaded tires for street trucks and sedans. The truck version comes in M2 compound and fits 2.2-inch-wide Pro-Line front or rear truck wheels and comes with firm foam inserts. The super low-profile (62.5mm overall) sedan version is available in S2 or S3 compounds and fits both 24mm and 26mm wheels. Both truck and sedan versions feature Pro-Line's unique shallow depth, street tread pattern.

Pro-Line, 201 W. Lincoln St. Banning, CA 92220; (909) 849-9781; fax (909) 849-2968.



HATORI HUSH PIPE

his is Hatori's new Muffler Tuned Pipe for 10- to 12-size engines. The design is intended to give good midrange response with smooth low to high rpm throttle transition. With its specially designed independent chamber at the rear of the pipe, this unit should prove to be unusually quiet—a nice feature if you happen to live near neighbors who love to complain.

Specially designed units and headers are available for Kyosho's GP10 and GP10 Spider.

Magma Intl., 18 Crown Steel Dr., Ste. 107, Markham, Ontario, Canada L3R 9X8; (905) 305-9753.

Apex Cubic reversing ESC handles 8-turn mods

If you want to go backwards really fast, you'll want to check out this screaming yellow unit from Apex. According to Apex, the Cubic can handle an 8-turn motor (with 6 cells) and has an on-resistance rating of 0.002 ohm. A 2-second reverse delay protects those delicate tranny gears, and a push-button setup makes it easy to operate. Heat sinks and capacitors are included, and a Tamiya battery connector and bullet plugs for the motor allow simple plug-in installation when moving up from a mechanical controller.

Magma Intl., 18 Crown Steel Dr., Ste. 107, Markham, Ontario, Canada L3R 9X8; (905) 305-9753.



this time the sequel is even better



more powerful then ever before this high performance racing pack now features Sanyo KR-1500sc cells, the only true 1500 cell in rc racing packs. RC5920, \$22.99

the legend returns! the most popular sport Lattery pack ever produced for R/C racing is Lack and it's now packing 1400 mAhs of raw power, and a new lower price!

RC 5922, \$18.99



MONY PENDING SE SIL GEORGE PROPERTY SHOPES



*** 5 Stars

"Better then the original, more action and a lower cost!"

INSIDE SCOOP

Model Electronics Corporation's (MEC) Solderless Power Tube stick-pack battery-pack system is new to R/C cars but proven in boats and planes. The



Solder-free stick packs?



Solderless Power Tube is basically a stick-pack building kit that has a unique twist: the battery pack is assembled without the use of battery bars, tabs, or solder! Just slide the cells of your choice (any 1.2V sub-C Ni-Cd will work) into the shotgun tube, install the endcaps and connectors and you've finished. Not only is it simple, but it's reported to be very efficient. too.

MEC's Single Cell Holder and Load Machine are designed to allow racers to check the condition and, with the aid of a stopwatch and digital voltmeter, match the cells that are placed inside the Solderless Power Tube. The single cell holder allows you to charge cells individually for the most accurate peak-charge possible. The Load Machine is a 30A single-cell discharger with a 0.9V safety cutoff that protects the cell from damage due to over-discharging. The Load Machine and single cell holder are equipped with Anderson Power Pole connectors for added convenience and efficiency.

Model Electronics Corp., 14450 20th Ave. NE, Seattle, WA 98155; (206) 440-5772; fax (206) 440-5905.



O.S. LD .15
YOU KNEW IT HAD TO HAPPEN

t should come as no surprise that the "for cars only" O.S. LD (laydown) .12 is now available in a .15 displacement. For those of you who don't already know, the LD is a true car engine—designed from the ground up for use in a car. In no way can the LD's ancestry be traced back to an aircraft-use beginning like all the other car engines we've been using all these years. Naturally, the preceding is only my opinion, and I can only add that I'm so happy to see the introduction of a larger version of the LD. I'm also very happy to tell you that O.S. has retained the superior slide carburetor design (with slightly enlarged venturi, I would guess) fitted to the LD .12. Yes, I will be running this engine in "Piston Power." See you there.

Great Planes Model Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300, or (800) 682-8948; fax (217) 398-0008.



Win a \$500 gift certificate from Duratrax.

Send a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, pleasel), along with a brief description, to Readers' Rides, RIC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. If we choose to feature your creation, you'll receive a 6-month subscription to R/C Car Action, or an extension of your existing subscription. You'll also be eligible to win a \$500 gift certificate from Duratrax in the ninth annual "Readers' Rides of the Year Contest" in the fall of 1999. In case we need to contact you, write your address and phone number on your letter and on the back of every photo you send. Good luck!

Aloha!

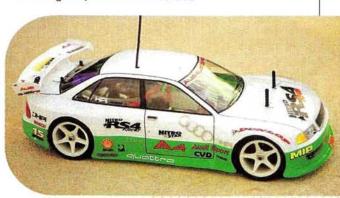
Ted Nguyen of Waipahu, HI, has the best of both worlds: an R/C car and airplane. The Tamiya Porsche 911 TGX has an O.S. engine, racing slicks and a 2speed transmission. The airplane is a Cessna Piper Arrow. Ted also enjoys running his RC10GT (not shown), which is equipped with a Stinger pipe, titanium turnbuckles and an HPI .15 Nitro Star motor.

Buggin' Out

This Losi XX 'CR' was put together by Jeremy Weyer of Eau Claire, WI. Powered by a Trinity Midnight motor, it has a Novak Tempest ESC, Trinity Race Tech 1700mAh batteries and an Airtronics XL2P radio. Jeremy added Trinity purple screws, titanium turn-

Road Rage

Bill Hubbard of Douglasville, GA, says his HPI Nitro RS4 Racer "burns up the road" with its HPI Nitro Star .15ss engine, 36odegree stinger pipe, 2-speed transmission, graphite upper deck, front and rear shock towers and rear brace, swaybars and belt tensioner-all topped off by an HPI Audi A4 body. Bill uses a Futaba Magnum Junior radio for control.



buckles, graphite suspension arms, an aluminum motor plate and MIP CVDs, and he spray-painted the body himself.

Long Rider

Kevin Eversole of Chesterton, IN, converted his Tamiya King Hauler into this extra-long (60 inches, bumper to bumper) big rig by stretching the frame and drive shaft by 31/2 inches. He also added a custom-wound.



Wimpy modified motor to complement the Gonzo matched batteries. A Futaba 4-channel radio keeps it in control, shifts the 3-speed transmission and unlocks the fifth wheel. Kevin "completely hand-built" the trailer, which features a solid aluminum deck, frame rails, balsa top and side ribs and black vinyl top. Its motorized support legs can be raised and lowered. It must take finesse to steer this thing around corners!

THE LEADER IN AWESOME R

READERS' RIDES

Quarter Scaler

Ken Garnhart of Winnebago, IL, shows us his sharp-looking, 1/4-scale, 1998 WCM Ki-E Evolution truck. It features a chromoly chassis, independent front and rear suspension, adjustable camber, caster and toe and disk brakes. Radio signals are picked up by a Tekin receiver, and an Airtronics Caliber 3PS does the sending. The truck is powered by a Zenoah G2D-70 2 HP engine, and nothing gets in its way.



On-Road Runner

This slick HPI CLK GTR Mercedes racer was built by Joe Prado of Woodland Hills, CA. It features: a full set of ball bearings; scratch-built tailpipes, antenna, light mounts and windshield wiper; RAm lighting system; tinted windows; chrome mirrors; and lowprofile super radials. A Novak Tempest speed control and JR Racing XR2 radio take care of the electronic needs while a Sanyo 2000mAh battery and a Peak modified motor give the car power. See you at the track!

Pantera Power

Martin Phipps of Forest Grove, OR, says his '98 1/10-scale BMT Pantera is equipped with a NovaRossi CX15 motor and a Paris pipe. The 5shoe Metalox clutch feeds power to a lightened 2-speed tranny and lightened diff. Futaba radio gear includes a 1024 FM PCM and S9303 steering servo while a JR NES 4735 servo was chosen for the throttle/brake. Features include a machined TMS aluminum lower chassis plate, titanium front axles and steering links, graphite steering arms, quick-change rear axles, a graphite mid brace, lightened motor mounts and a machined-aluminum brake bracket. Body is by Azata; paint job by Martin.

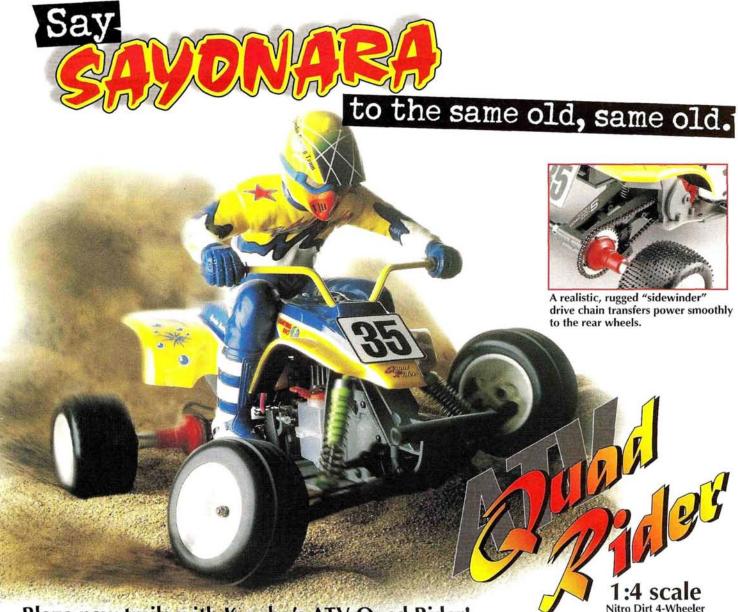


Mini Madness

These small R/C cars had a lot of heart put into them by their builder, Phil Valera of Chatsworth, CA. Beneath the blue Civic body is an HPI Mini RS4. Although it was a regular Mini when Phil bought it, he made it a Pro with full graphite, ball bearings, ball diffs, hardanodized shocks, a heat-sink motor plate and graphite belt tensioner. The Kawada 8-spoke mesh wheels have HPI belted X-patterns, and power comes from a Race Prep PZ-5 stock motor and

Pro-Match 2000 batteries. It's controlled by a Tekin G-12cIII and an Airtronics Caliber 3PS. The Mini Cooper is a stock Tamiya kit, except for the Tamiya sealed ball bearings and Tamiya pink-anodized Super Shocks. This Mini "gets around the track quickly" with the help of a Raven stock motor and Maxtec 2000 platinum batteries. It also features a Novak Duster II Sport ESC and an "old Futaba radio that works great." Phil also did the paint job on both cars. Nice goin'.





Blaze new trails with Kyosho's ATV Quad Rider!

Race miles past monotony with Kyosho's one-of-a-kind ATV Quad Rider. Its churning nitro power lets you charge over any terrain, with 1/4 scale detail supplying Supercross-style realism. Most assembly is factory finished—and a GT12S-CR recoil-

GT12S-CR recoilstarted engine comes included and installed. The action duplicates full-size dirt bikes, with efficient chain drive and a ball diff for excellent cornering control. Three long-stroke oil shocks, a front double wishbone suspension and rear swing arm/sprung monoshock keep it steady-as-she-goes over stormy tracks. The authenticity even

extends to a detailed, easy-toassemble vinyl driver figure! Bid "bye-bye" to the same old boring rides...get the ATV Quad Rider, and go crazy!

For the location of the dealer nearest you, please call 1-800-682-8948, and mention code number 0821Q.

Length: 16.9 in
Width: 12.3 in
Height: 12.6 in
Wheelbase: 12.4 in
Approx. Weight: 4.7 lb
Ground Clearance: 1.8 in
Engine: GT12S-CR w/pull start (included)
Requires: 2-changel radio w/2 serves ale

Requires: 2-channel radio w/2 servos, glow fuel, glow starter Note: Does not require specialized

electronics to operate

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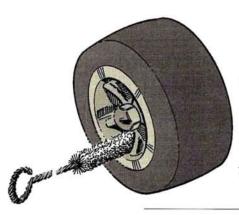


workshop ideas & innovations

ips

BY JIM NEWMAN

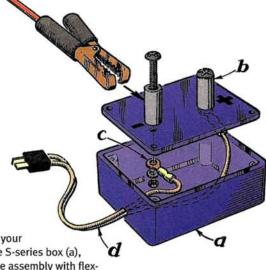
Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.



The Brush Off

These inexpensive bottle brushes are available from supermarkets, pet and drug stores. They are ideal for cleaning those hard-to-get-at areas of your car. BRIAN LETARTE,

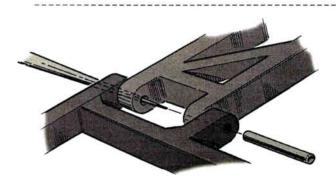
Trevor, WI



Alligator Smith

This simple adapter box allows you to keep the alligator clips on your charger yet easily plug in your battery packs. RadioShack has the S-series box (a), aluminum spacers (b) and 12-16 crimp terminals (c). Complete the assembly with flexible silicone-covered wire (d). Be sure the alligator clips are well insulated and cannot short together. JOSH SMITH,

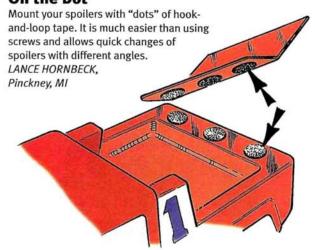
Seminole, FL



Line 'Em Up

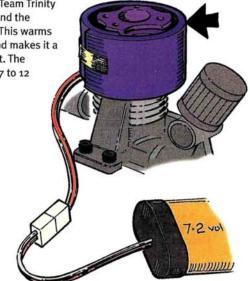
Installing pivot pins can sometimes be difficult if the holes are not all aligned. To line them up, insert a piece of same size pointed wire or an ice pick, then push the pins through from the opposite end, pushing the pick out as you go through. CHRIS BURDA, North Adams, MA

On the Dot

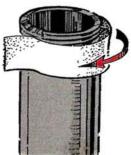


Hot Motor

If you run nitro cars in cold weather, wrap a Team Trinity tire warmer around the engine cylinder. This warms up the engine and makes it a lot easier to start. The warmers run on 7 to 12 volts. ZAC McVEY, Logan OH







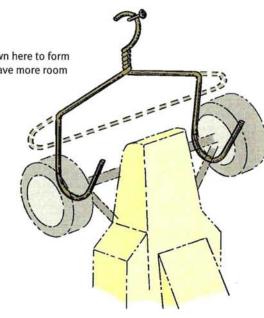
Car Hanger

Cut and bend coat hangers as shown here to form effective car hangers. Now you'll have more room on your bench!

FIRAS HAMADANI, Lawton, OK

Stop Shock Leak

Plumber's Teflon tape (available from hardware stores) can be used to seal the threads of shock bodies. Note the direction of the wrap. STEVE SHOLD. Burnsville, MN



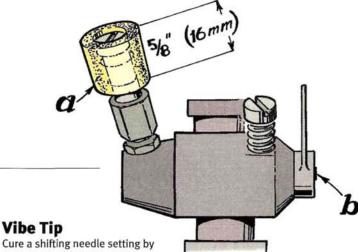
Give it a Lift

If you need more clearance to fit an aftermarket body onto your Traxxas Rustler, flip the body-post mounts over (arrowed) to raise them about an inch. JORDAN PHILIP, Littleton, CO



Peel Out

Carefully use a bicycle tire-removal tool to remove old tires from your R/C car wheels. LUKE FAILLA, Merlin, OR



Vibe Tip

forcing a piece of rubber fuel tubing (a) over the needle. The

tubing grips the head of the needle and the housing to provide some friction. A drop of blue Loctite on the low-end needle (b) prevents its setting from drifting but still allows adjustment. SEAN JAMIESON,

Sault Ste. Marie, MI

ROBINSON RACING PRODUCTS TROUBLESHOOTING

BY DOUG MERTES . ILLUSTRATIONS BY JIM NEWMAN

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at *Radio Control Car Action*, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

No Need to Keep-o your Nikko

I'm a little confused and looking for some guidance. I'd like to buy a Kyosho Sandmaster ST-2 gas-powered stadium truck. I already have a 27MHz radio with removable crystals from an older Nikko car. Do I have to buy the remote that comes with the truck, or could I save a little money and use the one I already have? Would I have to buy new crystals?

KIEL HICKS, Upton, WY

While the transmitter from your Nikko car may be compatible with one of the aftermarket 27MHz receivers, I doubt that you'd save any money by using it. By the time you buy the receiver, pick up the two servos and install a receiver battery pack, you'll be out as much money—if not more—than if you were to buy a complete setup. The Kyosho distributor in the USA packages the Sandmaster with a pretty good mid-level radio that's accompanied by the correct servos and related electronics to work with the vehicle. This is less expensive than purchasing the radio setup separately. Plus, better hobby-quality transmitters are equipped with adjustments you won't find on your Nikko—ones that are critical to the correct operation of a gas vehicle.



Extreme Results From RRP.

Richard Saxton Chooses Precision Components From Robinson!



Absolute Series Pinions: Available In 48P in 16T thru 28T sizes. Super hard, lightened and cut unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! RRP 1416 - RRP 1428.



Absolute Series Spurs: Available in 48P in 80T thru 91T, this is the quietest spur you can buy! RRP 1780 - RRP 1791.



RC10 GT Clutch Bells: Precision machined one-at-a-time from a single piece of steel and then hardened. Fits ALL Associated and MIP shoes. (New 14T) RRP 2214 - RRP 2224.



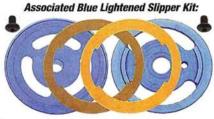
RC10 GT Gas Spurs: Super tough and precision machined from heatresistant plastic mesh flawlessly with our Clutch Bells. 32P in 61T thru 67T. RRP 2261 - RRP 2267.



1998 World Cup and National Champion Richard Saxton:

"I only care about performance, and that's why I run Robinson Racing gears and slipper clutches exclusively."

- Richard Saxton



The rear plate is hard anodized to reduce wear and the front plate is color treated. The front plate is designed to hold the slipper pad forcing the pad to slip on the rear plate. When pad shows sign of wear just flip it over for a new surface. Metal parts are CNC machined for a flawless fit. RRP 1515.



Titanium Stealth Top Shaft: CNC Machined from a single piece of titanium, this super hard, super light t shaft will fit any Stealth transmission. No serious rac should do without this part. RRP 1512.

"Turn to Robinson Racing when compromise is out of the question."

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Left-Turn Only?

I have a problem with my Associated RC10 that is equipped with a Midnight 2 Pro, a DuraTrax Blast ESC and a DuraTrax Piranha 6-cell battery pack. I'm having trouble with the steering servo. Every time I turn on the radio, the servo turns all the way to the left, and when it has gone as far as it can, it starts to click. This doesn't stop until I turn off the radio or unplug the battery. What's wrong with this car? BRUCE ELLIOTT, Pensacola, FL

There are several possible explanations for your misbehaving servo, Brent. Is this a new car that you just built, or did you recently replace the servo, transmitter, or receiver? If you did, you may simply need to center the servo. Make sure that the trims on your transmitter are in the middle of the adjustment range, then remove the arm or servo-saver from the servo's splined output shaft. Turn on the transmitter, then turn on the car, and the servo should center itself and remain still. If there's no vibration or clicking, just reinstall the servo-saver or lever arm in the center position (take care not to rotate the splined output shaft), and you should be ready to go. If the servo makes the clicking sound you described even when there's nothing attached to the output shaft, the servo's potentiometer or circuit board is probably toast. Unless it's a very expensive servo, it's probably not worth a \$25 to \$40 repair job, so replace it with the correct servo for this application (see your hobby shop or servo manufacturer for suggestions). It's always important to center the servo when you install a new one. After the servo has been centered, use the trim controls on

> the transmitter to make minor adjustments so that your car goes straight when you release the steering wheel (or stick).



New, Performance Enhancing Accessories For HPI Cars And Trucks!



RS4 Nitro Gear Adapter & Super Tough 44T Spur: Precision CNC machined, this adapter reduces outof-roundness and wobble. The spur is cut from a heat resistant plastic. Fits all HPI Nitros. RRP 1535.



HPI Titanium RS4 And Pro Tie Rods: Super strong, super light. 4mm RRP 1526. 3mm RRP 1525.



HPI Titanium Shock Balls: They're super strong and super light. The RRP 1524 are for shocks, and the RRP 1522 (short) and RRP 1523 (long) are for everywhere else.



HPI Stealth Sedan Spurs: These are high precision machined spur gears. The lightening holes reduce the rotating mass of the gear, boosting performance. They're available in 48P in 60T thru 96T sizes, and they'll fit any

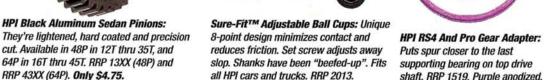
HPI electric car or truck.

RRP 1860 - RRP 1896.

8-point design minimizes contact and all HPI cars and trucks. RRP 2013.



Puts spur closer to the last supporting bearing on top drive shaft. RRP 1519. Purple anodized.

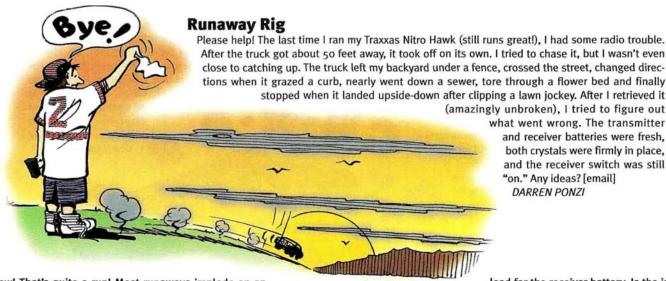




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REPLACEMENT

SERVOS

Wow! That's quite a run! Most runaways implode on an immobile object; you lucked out, big time. Your instincts were right in checking the receiver and transmitter batteries; these are often overlooked when troubleshooting gas-car radio problems. Nice work checking the crystals, but just because they're in place doesn't mean they're working properly. Replace them with another set, and perform a range test with the engine on. (Do this by parking the truck on a stand and walking away from it; don't drive the car away from you until it runs off!) Also check the wiring. Closely examine the antenna and the

lead for the receiver battery. Is the insulation worn away in any area due to constant vibration? Have you clamped the antenna lead under a

and receiver batteries were fresh, both crystals were firmly in place, and the receiver switch was still

"on." Any ideas? [email] DARREN PONZI

chassis part? Either scenario can sever the copper wire beneath the insulation and result in a runaway car. If you do find a break, carefully splice the wire and insulate the joint with heat-shrink tubing or electrical tape. Check your handiwork with a range test, and make a habit of inspecting your car for any potential problems-electrical and mechanical-between runs.

Servo Savior

Last fall I bought Associated's RC10T3 truck and had a lot of fun with it during the winter. Recently, I decided to race it, and everything went well for the first race. During the second race, my servo started making unusual sounds, as if the gears inside were stripping. I replaced the gears in my servo, but halfway through the next race, it did the same thing. I replaced the servo with the second servo that came with my transmitter, but that servo also died. I bought a metal-gear servo, which worked fine for two races. Then-surprise! It also broke. I'd like

to know how to correct this problem because buying new servos is expensive. If it makes any difference, my speed control is a Novak Racer EX. If you have any ideas, please help!

BRENT WEHAGE, Medford, OR

Wow! Three servos in a single night of racing; that has to be some kind of record! Solving it will require a little research on your part and an honest evaluation of your driving skills. First, you must understand that trucks, especially racing trucks, heave around some pretty big tires. Truck tires and wheels weigh substantially more than their buggy-size counterparts, so your truck requires a more stout steering servo than a buggy does. The tires are waaaay out there beyond the bumper or any other sort of protection, and they bear the

speed with the wheels turned? The steering linkage transmits all of that impact back down the line to the steering servo. Remember those little gears you replaced in your first servo? The teeth on those gears don't always survive a strong impact.

Knowing this, the designers at Associated wisely incorporated an effective and sophisticated servo-saver between the linkage and the servo. This little spring-loaded device actually gives a bit under stress and absorbs much of the blow. This servo-saver is so effective that

Associated recommends that you use a lever arm on it instead of an additional aftermarket servo-saver.

Here comes the research part: dig out your Associated assembly manual and completely disassemble your truck's servo-saver. When you put it back together, be absolutely certain that you've put it together and adjusted it properly. If you have any doubts at all about whether it's correct, let a knowledgeable racer check it out. Next, doublecheck the lever arm to ensure that you've installed the right piece (a slipping servo arm sounds and acts like stripped servo gears, and different arms fit different brands of servo).

> Finally, make sure there's no steeringlinkage binding because that may cause the servo to bind.

Here's the honest evaluation part: how often and at what speed do you hit the track walls, dividers and other trucks? Even a super-expensive pro-level servo will eventually wilt if it is constantly abused. The less often your wheels hit that stuff, the

> longer your steering servo will live.

brunt of any impact. Do

you know what happens

when you smack the wall

or another truck at high

power

BY CHRIS CHIANELLI

Revenge of the **Hydra Monster**

he ever-growing popularity of ready-to-run cars with their pull-start-and now, electric-start-systems has resulted in my beginning to hear from you guys about some new, recurring problems. Unlike "bump" starting or starter box starting, pull-start and electric start mechanisms have no inherent slippage. This means one thing: hydra-lock is the enemy! (I might give a pop-quiz on this in a future "Piston Power" column, so pay attention.) Hydra-lock occurs when the engine becomes very flooded, resulting in far too much fuel finding its way up into the combustion chamber, so that the piston can no longer pass through top dead center. When this occurs in your pull-start or electric start car (and sooner or later it will), do not attempt to force your engine through compression! Got that?

A hydra-locked combustion chamber can potentially cause a lot of damage. In the R/C airplane world, where they use super-strong electric starters that fit on propspinner cones, hydra-lock has been known to bend piston connecting rods. If hydra-lock can do that, imagine what it can do to the much more delicate components of pull- and electric-start systems. When your engine does experience hydra-lock, pull the glow plug, invert the car and crank the engine over so the surplus fuel in the combustion chamber and crankcase spills out the glow-plug hole. Start over with carb adjustments and don't over-prime the engine.

The other tip I want to pass on is to extend your pull-start handle. Yours truly has burned his knuckles more than once on a hot tunedpipe/muffler. If I've done it, I'm sure a few of you out there have done it, too. The photos show how to add a silicone-tube extension to move the handle farther away from the

pipe. Please! Make sure that you clamp off or tape off the starter cord so it doesn't totally disappear within the spool housing.

All Meshed Up, or "Sweet & Sour" Sleeve

Hello Chris. I recently purchased an RC10GT and I bolted an O.S. CZR in it. First, the gear mesh is too tight, even with the stock gears. Should I get a new pinion or spur? Second, while the engine was still in my Rampage Pro (buggy), my friend (who will never touch my vehicles again) was helping me find the "sweet spot" on the engine, and he made it

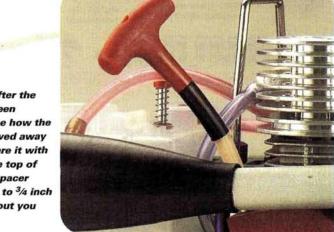
run a little lean; well, real lean, and now, within two days, all the compression is gone. Is this normal on an engine that has been run lean? I used to be able to pull the starter

rope, and the cylinder sleeve would slide out a little; that's when it ran real good. It doesn't do that anymore, and that's when it stopped running good. Please help a desperate racer. Reed Fiegener P.S. You and Luna kick some serious BUTT!

Well, Reed, First and foremost, your buddy may not know the difference between

"sweet" and "sour." It's a phenomenon; guys who know the least often act as though they know the most ... or everything. Don't let anybody touch your engine unless you've witnessed firsthand that their engines run well and, more important, that their engines last a long time!

In all fairness to your buddy, however, your worn engine might be your fault after all. A really tight pinion/spur gear



Right: after the spacer has been added, you can see how the pull-start handle is moved away from the tuned pipe; compare it with what's shown in the photo at the top of this page: the same car before the spacer treatment. Above: all it takes is 1/2 to 3/4 inch of tubing, depending on how far out you want to move the handle.

PISTON POWER

mesh can also make an engine run too hot. Your gears don't need replacing; they need adjusting. (Did you read the instructions, Reed? Don't fib.) To adjust them, loosen the four screws that hold the motor mounts to the chassis. Place a piece of paper between the pinion and spur gears. Push the

engine so the gear mesh is quite tight (the oval engine-mount holes in the chassis allow sliding). Now retighten the four screws, remove the paper and your mesh should be just right.

Your example with the sleeve is a great illustration of a piston and sleeve when it's in good shape

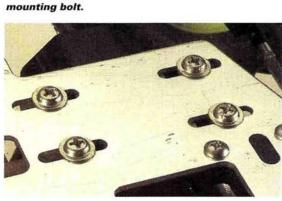
and when it's not.

When the engine's head is removed, a piston will often push the sleeve out of the case, depending on how tight a given manufacturer fits the sleeve into the case because the piston-fit should be tight



Depending on how tighly the manufacturer has fit the sleeve in the case, it is normal for the piston to push the sleeve out of the case during crankshaft rotation when the cylinder head is removed. If your engine did this at one time but does it no more, the piston fit in the sleeve may now be too loose for proper operation.





The four-engine mounting holes in the chassis are elongated so the engine can be moved for good gear mesh and to accommodate alternative ratios.

at the top of the stroke when cold. It's machined that way so the fit will be optimum when hot. In short, Reed, if your piston pushed the sleeve out of the case when it was new, but now it doesn't, and it passes top dead center too easily, with no resistance from the sleeve, it's time to replace the piston and sleeve.

Oh yes, Reed! You're right on about something else: Luna does kick butt. CC

Everybody is an expert

I've been into real R/C for about a year (considering RadioShack's vehicles don't really count), and recently, I have taken the challenge of trying out the great world of gas with the purchase of a Dodge Ram truck. I haven't run the engine because I want to replace the muffler (or should I say fishing lure?) with a tuned pipe. To my dismay, though, I was told that the Dodge Ram was not designed to accommodate a tuned pipe and that even if I could find a place for it, the engine—only equipped with bushings—might not be able to "hack it," and the transmission was not designed for the extra power. Is this true? Would I risk ruining my transmission or QRC with the extra power? Couldn't I just replace the bushings with bearings? Please don't say I have to use a "snorkel" for a muffler!

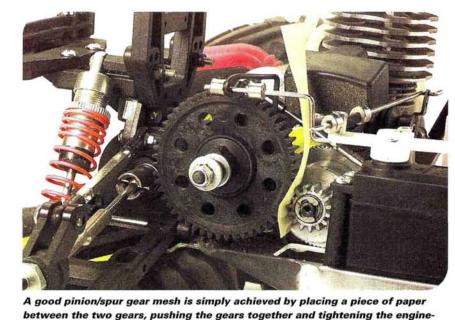
Tyler Yanta Cochrane, Ontario, Canada

Oh, Tyler,

Where are you getting this "expert" advice? The bushed engine in your Dodge is the same as the one in the Pure Ten cars that race in the Kyosho Cup. All those guys run tuned systems. The tuned mufflers (a little different from all-out tuned pipes) available from Kyosho (and MIP and DuraTrax) really smooth out performance across the entire rpm band, and they do it while making the engine run cooler!

As for fitting the logistics in the Ram chassis, you might have to get creative. MIP's rear-exit Stinger might do the trick if Kyosho's long, tuned muffler—the one I would recommend first—won't fit. CC

dard setup used in the **Kyosho World Cup Series** Racers. It's Kyosho's stock bushed engine with long tuned pipe. A ball-bearingsupported crankshaft wasn't introduced until very recently.



This is the approved stan-

doctor

BY DOUG MERTES

Handy Painting Tips

nlike some artistically inclined hobbyists, I never had a reputation as an accomplished painter. Although a few concours events have been decided in my favor, I don't own an airbrush. Somehow, I've managed to get the look I want by using cans (also known as "paint bombs"), brushes and bottles. Even without an airbrush, I do a pretty good job of finishing bodies so that they look realistic as well as colorful. And given my driving skills, I get plenty of opportunities to replace bodies that are, shall we say, well worn. I've never written an article on body painting, so this is a good opportunity to share some of my quick and easy tips on how to do a basic paint job.

BULK BUYS

Bottled paint lasts for years (I still have some from when I bought my very first kit), and high-quality brushes can last a decade or more if they're cleaned after each use. Consider the better bristle brushes at artist's supply stores. A good brush is like a good tool: it will help you do a better job for a longer time. I like 3M masking tape because it resists tearing and seepage, comes on a wide roll that I can easily cut with a hobby knife and doesn't leave any adhesive residue behind. I always buy a couple of rolls when it's in stock. At five bucks each, it's not much of an investment, and it's in the cupboard when I'm ready to paint. I do the same thing with other supplies and decals so that my painting projects are always set up in advance.



There's a word for the white-handled brush: disposable. To produce good work, use good brushes. The detail brush shown isn't cheap, but it does deliver superior results and, cared for properly, will outlast a hundred el-cheapo brushes.

FIT-O-RAMA

Many R/C'ers like to completely fit the body on the car before they start to paint. Sure, I'll drill the holes for the body posts and antenna tube, but I stop short of cutting out the trim lines and wheel wells. I think it's easier to cut the holes for the body mounts when the Lexan is still clear, but usually, nothing else gets cut. It's easy to cover up the body-post holes with small squares of masking tape to prevent spray from going through onto the outside of the body, but I find it much more difficult to protect the exterior from overspray once the wheel wells have been cut out.

TEMPERATURE, SUNLIGHT AND HUMIDITY

Paint will dry and cure properly when the weather is dry and sunny. I like temperatures around 70 to 80 degrees (although I've also painted indoors in the middle of winter) with

low humidity. If the temperature is a little lower than ideal, heat up the body for a few minutes with a hair dryer. That seems to help the paint adhere a little better to the polycarbonate and ensures that the painted surface is as dry as it can be. Don't dry the paint with heat, however, since that will make the masking tape gooey and will sometimes cause the paint to come off in strips.





Above: before you start, when spraying outdoors in cold weather, use a hairdryer to warm the body and facilitate paint adhesion.

Left: for a stronger spray from aerosol cans, try warming the can under hot (not scalding) running water.

WASH 'N' MASK

Prep the body by washing it at the kitchen sink with a clean sponge and dishwashing detergent to cut the grease. After scrubbing everything well twice on the inside and out-

side, I rinse with warm water to eliminate all the soap and the silicone release agent left over from the molding process. I use two or three paper towels to completely dry the body. Then I mask all of the windows and the paint scheme, making sure that the edges of the masking tape are pressed solidly against the Lexan so that no paint can seep under it and ruin the job. Before I begin to paint, I use a 2-foot length of clear-plastic food wrap to cover the body's exterior to prevent overspray from adhering to the outside. If the wrap won't stick to the body, warm it with the hair dryer, and it will shrink slightly and cling like





Use lint-free paper towels to dry the shell.



Some bodies include precut window masks; if yours doesn't, use good-quality 3M tape to mask them.

DOIN' THE SPRAY

Since I usually paint several bodies at a time, I need to be sure that the first light coat is sufficiently dry before I apply a second. If you apply too much paint at once, it will run, drip and seep under the edges of the tape. If your paint can is cold and doesn't put out a fine, strong spray, warm it by running hot tap water over it for a few minutes (not so hot that you can't hold the can comfortably). Heat will increase the pressure inside the can and give you a

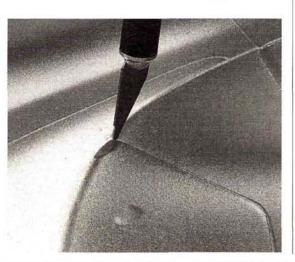
ing red (soft), green (med-soft), blue (med)

and gold (hard). These new special com-

pounds are both sticky and long-lasting.

better spray. Fifteen minutes between light coats gives the paint plenty of time to tack up without flaking and allows you to pull the tape off the next masked area for the following lighter color. Use a no. 11 hobby-knife blade to pop up the corners of the tape in the masked areas, then carefully peel the rest off with your fingers. Never try to peel masking tape off fresh paint with your fingernails, or you'll smudge the edges of the paint and ruin your hard work!

Always lift masking with a hobby knife or a similar tool before attempting to pull it off with your fingers; if you pick at it with a fingernail, you're bound to scratch the surrounding paint.



THE BIG FINISH!

Always finish your paint job with a uniform backing color such as white. silver, or gold. It will make your work appear much more professional, and the light will actually bounce off the backing coat and back through the color, making it appear brighter. White makes colors really pop out, especially when you use some sort of contrasting color scheme. Although Pactra* makes a special white for backing its fluorescent paints, I've found that this tends to flake off in an impact and that Sprint White adheres better. Silver tends to dull solid colors, although it really adds a lot of pep to "candies" and metallics. Spray silver behind yellow to get a mustard color, for instance. Gold makes many colors look darker. I've used gold behind Racing Red to make a car look brick-colored. Of course, if you're trying to save weight, a single color applied in two light coats will minimize weight. Black, white, silver and gold require no additional backing color.

Take a little time to plan your painting, gather the supplies in advance, and wait for the right weather to do the job. Even simple paint jobs can look pretty snappy when they're done properly. See you on the track!

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

2001 NAS Wheel, lightest and strongest

wheel in today's market.



cular Mill).

EPIC canne and can be wound in all popu-

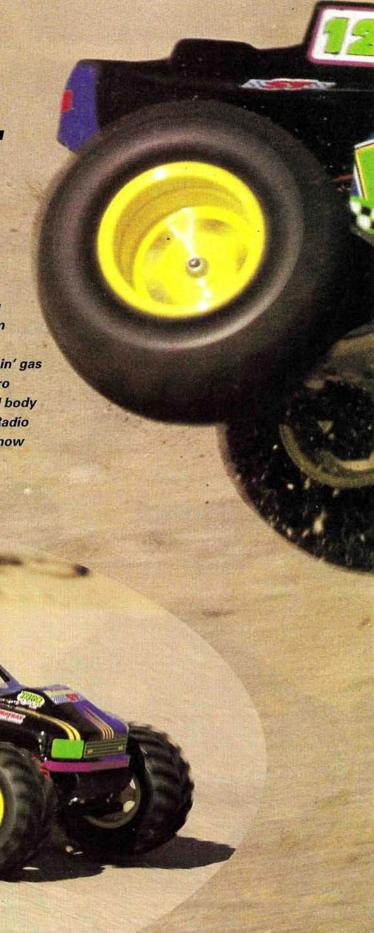
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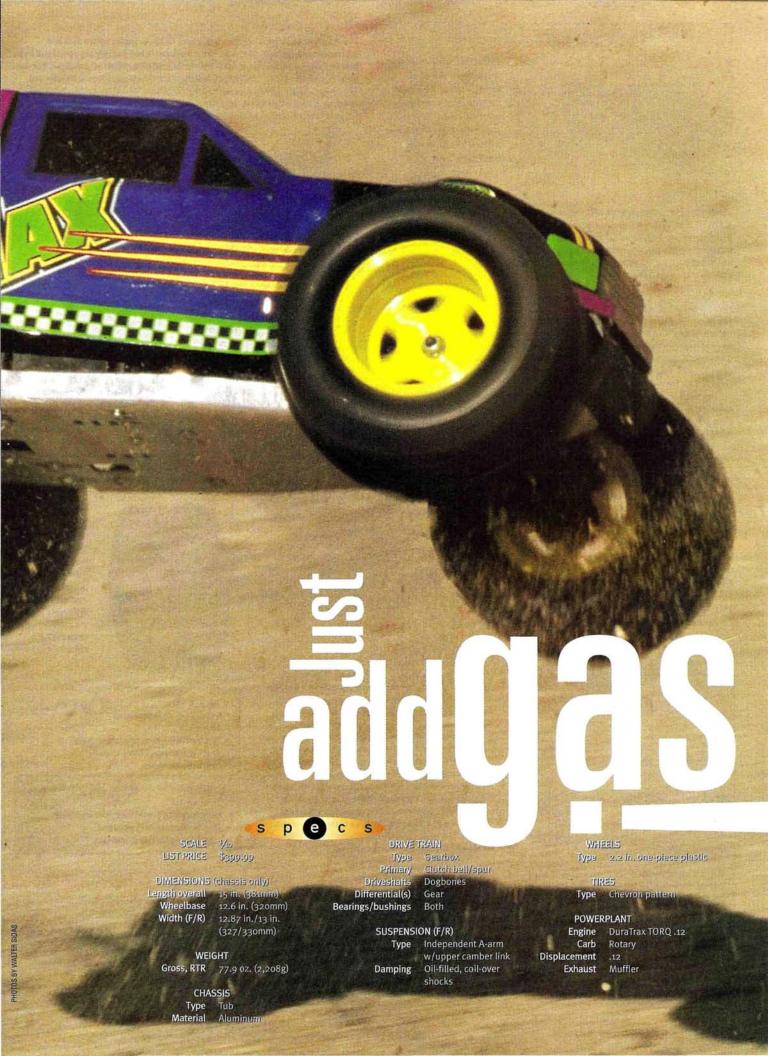


DuraTrax **Maximum ST**

Doug Huse

When I hear the name DuraTrax*, I think of R/C accessories; you know, gold shocks and heatsink heads—all the neat little stuff to personalize your car and improve its performance. I did not think of DuraTrax as a kit maker—until now, that is. DuraTrax has put together an all-in-one box, ready-to-run, literally gas-and-go stadium truck, the Maximum ST. The Max is an entry-level truck designed for the first-time R/C'er who just insists on goin' gas and for the electric veteran who is ready to take the nitro plunge and wants to run NOW! A painted and trimmed body is included. What more could you ask for? If you said "Radio batteries," guess what? They're in there, too. Let's see how the Max stacks up.





DURATRAX MAXIMUM ST



The Max's gearbox is equipped with a slipper clutch—a highly desirable feature. The gearbox is a three-gear, full ball-bearing unit with a metal-diff case gear. Power is transferred to the rear wheels via machined steel dogbones and bushing-supported steel stub axles. All this

Here the Max is shown with the included Hitec radio. The rest of the accessories are all you need to get up and running. Duratrax offers them in one package, too.

TORQ .12 PULL-START ENGINE AND CLUTCH

The Max gets its power from DuraTrax's new TORQ .12 engine with a cast and machined oversize heat-sink head. The crankshaft is ball-bearing supported and has a bushing-supported, machined-steel connecting rod with drilled oil passages. The carburetor, which is fed by a large 85cc fuel tank, is a rotary-valve type with low- and high-range needle valves. A cast-aluminum clutch bell that rides on two 5x10mm ball bearings is driven by a heavy-duty three-shoe clutch. Last, the standard canister-type exhaust keeps the noise level relatively low. That should keep the neighbors happy!



adds up to a solid setup.

SEALED GEARBOX

ALUMINUM CHASSIS The Max's 2mm-thick, stamped-aluminum chassis is formed into a tub to reduce flexing. A rear turnbuckle brace further enhances rigidity and also helps to maintain the proper clutch bell and spur gear alignment when the going gets rough. Twenty degrees of kick-up up front aids handling and prevents the nose from planting itself when landings off those crazy jumps aren't quite picture perfect.

The small aluminum plate behind the steering cranks houses the receiver battery and switch in one neat unit. The receiver is taped to the bottom of the plate, but the battery is held on with just a tie strap. I recommend that you put servo tape between the two for extra security.

PREPAINTED BODY AND CHEVRON-TREAD TIRES

Now, this is what I call ready to run. The body is not only painted in twotone blue and black, but it has also been trimmed, and the mounting holes have been drilled. Just apply the stickers and it's done. DuraTrax also went one step further with the tires: they're glued to the rims and are ready to go.

■ Take the time to

go over the manual

and video even

BUILDING & SETUP TIPS

though the truck is RTR. It's a good way to familiarize yourself with the vehicle.

- Grab a screwdriver and make sure all the screws are tight. Chances are, none will be loose, but it's nice to have peace of mind.
- Remove the engine-mounting screws from the bottom of the chassis, and put a drop of Loctite* on each screw. When you do this, remove and reinstall the screws one at a time so you don't disturb the gear mesh.
- Cut a hole or some slots in the windshield to allow the engine the cooling air it needs to operate properly.
- Purchase and install a fuel filter. It's cheap insurance and, in my opinion, just as important as the air filter.

STRESS-TECH INDEPENDENT SUSPENSION

All plastic parts are made of DuraTrax "Stress-Tech" plastic. The parts are very strong yet relatively flexible to help absorb the abuse that off-roading can dish out. Stress-Tech is very forgiving of that occasional run-in with the curb and the rock that always seems to jump out in front. DuraTrax has enough confidence in the material to offer a 6-month replacement guarantee on all parts. Both front and rear suspensions feature lower A-arms with steel, turnbuckle-type upper camber links. The aluminum-body, oil-filled, coil-over shocks on each corner have threaded bodies for fast spring-preload adjustment. The shock towers and lower arms each have three shock-mounting points to facilitate chassis tuning. The arms, upper links and shocks are all identical and interchangeable front and rear.

YOU'LL NEED

- Model engine fuel —10- to 20-percent-nitro recommended.
- · Glow-plug igniter.
- · Glow-plug wrench.
- · Extra glow plug, just in case!

An installed and set up Hitec Lynx AM radio system is included with the Maximum ST package. The transmitter has steering dual rate with override and servo-reversing switches, and there's a charge jack in case you wish to change over to Ni-Cd batteries when the included dry cells bite the dust. Hitec's HP-2RNB receiver and a pair of HS-303 servos are also included and installed.

BELL-CRANK STEERING

The steering system incorporates a servo-saver and is connected to cast-aluminum 4WD-style hubs via steelturnbuckle tie rods.

- AA batteries.
- Slipper clutch is standard.
- · Aluminum shocks.
- . Turnbuckle tie rods and upper links.
- · Bearing-equipped drive train.
- Instructional video.
- Complete "ground-up"



- · Turnbuckle tool isn't included.
- · Cast-aluminum clutch bell (steel is preferable).

FACTORY OPTIONS

- Bearing completer set-part no. DTXC1090.
- · High-flow air filter-DTXG2612.
- Nitro starter set DTXPo200.
- Front rib tire-DTXC8000.
- Rear/front step-pin tires—DTXC8115.

EST GEAR . Hitec* Lynx radio system with HS303 servos (included). DuraTrax Red Alert Fuel (not included).

DURATRAX MAXIMUM ST

PERFORMANCE

The Max was designed for anyone who wants to get started in R/C, so I enlisted my friend Kathy and her son Eddie for the first part of my test, since their knowledge of gas R/C (or any type of R/C, for that matter) was limited to that of a spectator. After reading the manuals and watching the video twice, it was time to step outside and fire up the Max. They followed the manual step by step and were able to start up the Max and break it in, but they mostly attributed their success to the video. Though the manual was adequate, they felt that without the video, they would have had problems. Including the video was a smart move!

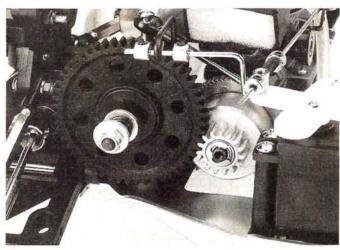
Then it was my turn. With the engine fully broken in, leaned out and ready to go, I pulled full throttle and took off. The properly set slipper won't let you do holeshots, but that's actually a benefit, as it protects the gears. That was the only "protection" I allowed the Max; I went out of my way to hack on it-over jumps, into ruts, barrel rolls, endos and, yes, even into a tree, but the Max stayed together! I chose a very rough test field, and the Max's suspension handled it quite well. I really did abuse this truck more than usual to see whether the "Stress-Tech" parts would hold out, and they did. The engine ran well, developed plenty of power and idled beautifully. Eddie took over the controls and, well, the look on his face said it all! He had a blast. That's exactly what the Maximum ST is all about-no hassle, no headache; just lots of fun!

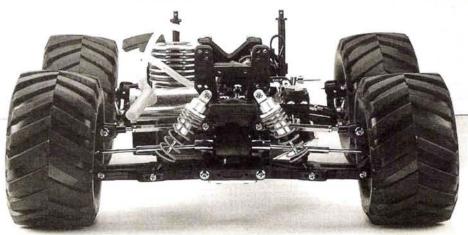
FINAL THOUGHTS

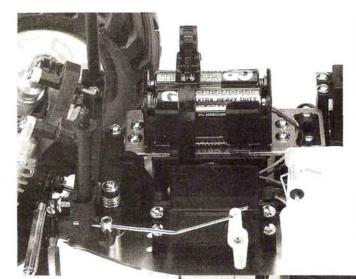
DuraTrax has put together a package that is easy, convenient and fun. It performed up to my expectations and even beyond. The only part that broke during my torture test was the antenna tube! I guess I can live with that; I'll have to dig 50 cents out of the sofa and buy a new one. If you're looking to get started in the R/C hobby or are thinking about moving up from an electric to a sport gas truck, be sure to consider the DuraTrax Maximum ST.

Right: the Maximum ST comes equipped with a slipper clutch and ball bearings for the clutch bell. Behind the bell is a three-shoe clutch assembly—pretty impressive for an entrylevel truck.

Below: check out the wide stance; handling bumps is no problem for this truck. Beefy turnbuckles and axles reduce the chances of parts breaking.







Left: the Hitec electronics are installed at the factory. All you have to do is place the supplied AA batteries into the receiver battery case and transmitter, and the truck is ready to go.

Below: the shock bodies are threaded to allow easy preload adjustments. The cast 4WDstyle steering knuckle is an odd sight on this 2WD truck; however, it's a stout part that shouldn't break.

IE COMPETITIO

	DuraTrax MAXIMUM ST	Traxxas NITRO SPORT
Wheelbase	12.6 in. (320mm)	11.31 in. (287mm)
Width (F/R)	12.875/13 in. (327/330mm)	2.5/12.36 in. (64/314mm)
Weight	77.9 oz. (2,208g)	68.5 oz. (1,942g)
Diff type	Bevel gear	Planetary gear
Chassis	Aluminum	Composite/aluminum
Painted body	Yes	No
Electric start	No	Yes
AA batteries	Yes (12)	No
List price	\$399.99 (RTR w/radio)	\$345 (RTR w/radio)
Available at*	\$249.99	\$289.99
Reviewed in	4/99	6/98

^{*}Prices vary with location.

^{*}Addresses are listed alphabetically in the Index of Manufacturers on page 209.



HPI RTR Nitro RS4

by George M. Gonzalez



et's give HPI* credit for pioneering what has become one of R/C racing's most exciting classes. Thanks in large part to the popularity of the company's Nitro RS4, 4WD nitro touringcar racing has enjoyed a growth in popularity, and many R/C manufacturers are catching the wave by releasing nitro versions of their most popular electric touring cars.

HPI's Nitro RS4 and Nitro RS4 Racer kits are still at the top of their game as far as quality and performance are concerned, but for '99, the venerable Nitro RS4 has undergone cosmetic surgery and

has an all-new look-and an all-new attitude, Interestingly, this second-generation Nitro RS4 is offered ready to run (RTR) with a-2-channel radio system installed on the chassis.

The RTR Nitro RS4 (or "RTR Nitro" as I'll refer to it) is HPI's first R/C offering to leave the factory 90 percent assembled, and that feature alone might just attract more of you to join in on the excitement that nitro touring-car racing provides. I know I'm eager to start racing my RTR Nitro, so join me as I take it out of the box, down to the track and into competition.



SCALE LIST PRICE \$519

DIMENSIONS

Wheelbase

Gross, RTR 58 oz. (1,588g)

CHASSIS

Туре Aluminum lower/molded Material

DRIVE TRAIN

Type Triple-belt continuous 4WD Clutch bell/spur gear Differential(s)

Bearings/bushings Bearings

Plastic-body oil-filled Damping

WHEELS

Dimensions (DxW)

TIRES

HPI M-compound radials w/foam inserts

POWERPLANT

HPI 15FE 2-stroke (included) Engine

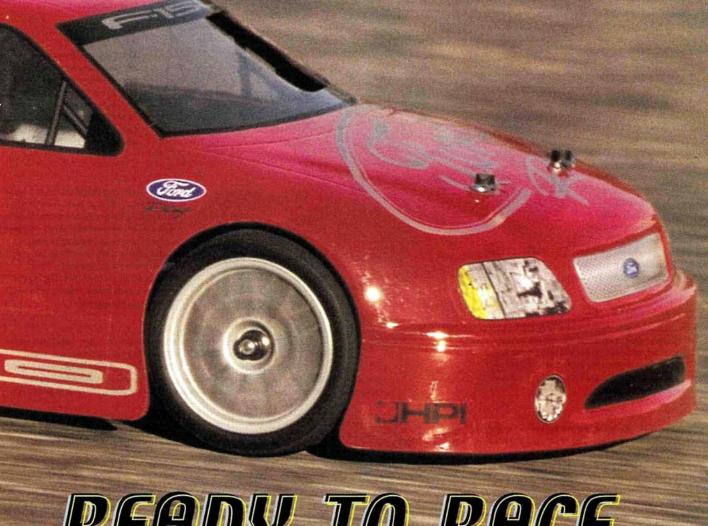
Carb 4mm barrel

Tuned muffler and exhaust

manifold

Starter Recoil pull-start mechanism O'Donnell 20 and 30% nitro

RADIO GEAR (included)



READY-TO-RACE EXCITEMENT



FACTORY ASSEMBLY

The RTR Nitro arrives 90 percent assembled with the high-quality HPI/Airtronics Rival 2P 2-channel AM radio system installed. The Rival 2P has steering dual rate, which is a necessity for racing. Two 94102 servos handle the steering and throttle and brake duties. HPI logos replace the Airtronics logos on the radio—an especially nice touch.

WHEELS, TIRES AND BODY

The RTR Nitro comes with a complete set of HPI's new gray mesh wheels and M-compound radials with foam inserts. The tires work just fine on dusty unprepared surfaces, but you might want to consider using softer, racing tires if competition is on your agenda. The first production RTR Nitros will be available with a cool-looking Ford F-150 FLARESIDE body or a racy Nissan Skyline R34 25GT body; both include window masks and complete decal sets.

NEW FRONT- SUSPENSION GEOMETRY

The RTR Nitro features the same caster and steering blocks as HPI's RS4 Pro 2. The suspension arms are a wide (200mm) version of the Pro 2 arms. The shock tower is similar to the Pro 2 design but is made of "regular" plastic instead of molded carbon fiber. The non-adjustable camber and steering links are all of the same length, and that eliminates confusion when maintenance time rolls around. The RTR Nitro also includes a new bellcrank steering system that places the servo-saver on the servo horn instead of the bellcranks.

OIL-FILLED SHOCKS

The RTR Nitro includes the same plastic-body, oil-filled, coil-over shocks as its predecessor. The shocks arrive built and installed, and those on our test vehicle had been built with absolute precision; we didn't find any air in any of the shocks, and all had just the right amount of rebound and were of the same length.

NEW POWERPLANT

HPI's Nitro Star 15FE engine is standard and arrives installed. This new mill has 15 to 20 percent more power than the previous .12-size engine, but it's just as reliable. The engine has a strong steel connecting rod, a heat-sink head, a reliable and easy-to-adjust, single-needle barrel carb and a heavyduty pull-start mechanism. The stock engine mounts aren't adjustable, but HPI offers optional mounts that make it possible to use other clutch bell and spur gear combinations, as well as other optional engines.

BALL BEARINGS

HPI pulled out all the stops and included a complete set of ball bearings.

RACING CHASSIS

The RTR Nitro has the same 2.5mm-thick, purple-anodized and countersunk chassis as the Nitro RS4 Racer.



75CC

the 75cc

fuel tank

will provide

approximately

4 to 8 minutes of run time. I ran out of gas toward the end of a 5-minute qualifier, though, so driving style and fuel mixture will definitely affect run time. The tank has a quick-fill fuel cap and a handy springloaded primer.

NEW TUNED-MUFFLER SYSTEM

The tuned muffler and manifold system works very well and is more efficient than the model airplane canister muffler that was included with the previous kits. The flat-sided pipe tucks in nicely beneath the included flare-side truck body.

NEW MOLDED UPPER DECK

The all-new, extremely rigid molded upper deck is, in my opinion, more esthetically pleasing. A platform allows the receiver to be mounted lower on the chassis. The new upper deck also has a versatile receiver battery pack mount, and a large carrying handle makes it easy to hold all four wheels off the ground when blipping the throttle or carrying the chassis to the track with the engine running.

EFFICIENT DRIVE TRAIN The Nitro RS4's triple-belt drive train with single molded disk-brake system and bevel-gear differentials has been carried over to the RTR Nitro. This means that most of the Nitro RS4 and Nitro RS4 Racer hop-ups

will work on the RTR Nitro. Steel dogbones transfer power to all four wheels, and a 13-tooth castaluminum clutch bell with 2-shoe clutch and a 44-tooth molded spur gear serves as the primary drive.



Here's what you get in the kit box. As you can see, this car is almost ready to race. Your only effort was to open the box; HPI does a great job of putting the kit together for you.

YOU'LL NEED

- 12 AA alkaline or Ni-Cd batteries for the radio gear.
- · Glow-plug igniter.
- · Glow fuel -20%-nitro recommended.
- · After-run oil.
- Fuel bottle—not absolutely necessary, but highly recommended.
- · Extra glow plugs.
- · Polycarbonatecompatible paint.
- . CA for the tires.

PERFORMANCE

The RTR Nitro made its first racing appearance at California R/C Center in Anaheim. Nitro touring-car racing is popular there, so I wasn't surprised to find out that there were enough racers registered in the nitro TC class to fill two heats.

The parking-lot track is on concrete, and I knew that the kit's hard-wearing tires are not cut out for serious competition even though they're ideal for play. For competition-ready traction, I glued a complete set of HPI's new 26mm belted super slicks with molded, mediumcompound inserts onto the stock, gray, mesh wheels.

Without any practice, I set the car down on the track and warmed up the engine before the first qualifier. The car had an abundance of steering, but the rear end remained planted when I pitched the car into the corners. I was immediately comfortable with the handling, and within two laps, I had enough confidence to do battle.

At the starting tone, I was off in a cloud of nitromethane, and then a

The RTR Nitro features the same highperformance suspension geometry as the RS4 Pro 2 electric tourer. The nonadjustable, equal-length, camber and steering links provide approximately 1 degree of negative camber and 1.5 degrees of toe-out. Adjustable tie rods can easily be installed to allow camber BUILDING & SETUP TIPS

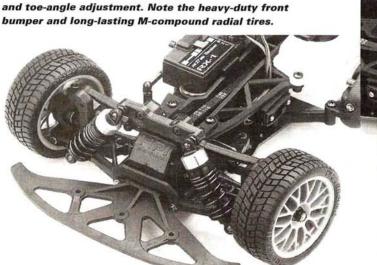
The RTR Nitro comes 90 percent assembled, so there isn't much left to do: just glue the tires on the wheels and paint and detail the body. But proper engine break-in is of utmost importance, and even though HPI provides excellent instructions, I'll pass along a method that will safely and effectively break the engine in without the mess that usually results from running an engine at an extremely rich needle-valve setting.

- This virtually zero-load method of engine breakin requires plenty of ventilation, so step one is to move out of the workshop and into the backyard.
- Before you turn the engine over for the first time, remove the glow plug and put a couple of drops of good after-run oil into the glow-plug opening. Also put a few drops of this oil on the foam air filter, and make sure it soaks in.
- With the glow plug removed, pull on the starter rope to turn the engine over a few times. This will lubricate the piston and sleeve and all of the engine's most vital components. Reinstall the glow plug, and you're ready for engine break-in.
- Put the car on a sturdy car stand to hold the wheels off the ground, and use an electric fan in front to direct cool air toward the engine. Completely close the needle valve and then open it 3 full turns.
- Fill the tank with high-quality 10- to 20-percent model car engine fuel, and prime the carburetor until you see fuel in it.
- Install the glow plug igniter and pull the starter to start the engine. Two or three tugs should be enough to start it.
- With the engine running, adjust the idle-speed screw on the carb until the engine idles steadily without stalling.

■ With the car stationary on the stand, run four tanks of fuel through the engine. Stop the engine between tanks, and let it cool completely. Each time the engine is stopped, make sure the piston is in the down position at the bottom of its stroke. While running the engine, check its temperature often and "richen" the mixture as necessary to keep it running cool.

I highly recommend that you pick up a temperature gauge; MIP* makes a fine unit. If you don't have a gauge, try the drop-of-water method. If the engine is running at the correct temperature, one drop should slowly boil off the engine head in about 3 seconds; if it evaporates more quickly or "explodes" off the head, the engine is too hot. You'll occasionally need to adjust idle speed, too, because as the engine is broken in, the idle speed will tend to slowly increase.

- If the engine gets too hot (over 230 degrees Fahrenheit, if you have a gauge), put your thumb over the air filter to stop it, and let it cool down. After the fourth tank of fuel, turn the engine off and let it cool to room temperature.
- You're now ready to set the needle valve to obtain the proper blend of performance and lubrication. Close the needle valve completely and then open it 21/2 turns. After this, follow the instructions provided in the manual to fine-tune the carburetor.
- Proper engine maintenance is just as important as proper engine break-in. To ensure proper engine cooling, be sure to make a large opening in the front windshield and remove the drivers' side window. Cut out part of the rear window to allow hot air to exit.
- After each day of racing, remove the glow plug and put a few drops of after-run oil into the glow-plug opening and the carburetor venturi, and then turn the engine over a few times to distribute the oil.
- Also clean the foam air filter in soapy water, then add a few drops of oil after every hour of running.



The new Nitro Star 15FE is reliable, and the new tuned muffler system is the next best thing to a tuned pipe. Adding a tuned pipe and HPI's optional machined heat-sink head and SS carburetor will increase performance.

- High-quality assembly.
- likes · Ball bearings are included.
- Excellent radio system.
- . Good handling right out of the box.
- . Thorough engine break-in instructions and detailed tear-down illustrations are included.
- · Excellent factory support and website: www.hpiracing.com.
- Although dislikes dislikes the molded, non-adjustable camber and steering links are a great feature for beginners, they're a real turn-off for racers.
- The cast-aluminum clutch bell and flywheel are inferior to the steel clutch bell and aluminum flywheel found on previous kits. When installing MIP adjustable clutch shoes, I broke one of the clutch-shoe mounting pins off the flywheel.
- · RTR kit is not available without a radio for those who wish to install a system they already own.

pile up in the first sweeper allowed me to pass several cars and even take the lead for a short while.

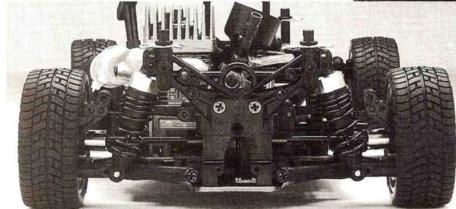
I soon realized, however, that there were several faster cars on the track, so I let the more tenacious racers pass me while I just kept a respectable pace. Before I knew it, the race was over; I had held my ground and finished fourth. My car actually ran out of gas just inches in front of the start/finish line, but the race director let me slide (thanks, Charley).

The second qualifier went as well as the first, and I finished fifth without running out of gas. My second round was actually faster than my first, and when the Mains were posted, I was pleased to find that I had qualified fifth in the A-main.

The Main also went without a glitch, and my RTR Nitro felt even more dialed than it had in the previous heats, no doubt because of all my careful preparation after the qualifying heats; before the

The new upper deck features a user-friendly receiver battery-pack holder and a platform that allows the receiver to be mounted slightly lower. Note the neat wiring job.





The RTR's rear end is virtually the same as that of its predecessor, but a power-robbing silicone exhaust tube no longer fills the hole in this shock tower. The non-adjustable camber links are the same size as the front camber links.

main event, I actually took the time to sauce the tires with Paragon* Ground FX. Again, my RTR Nitro was not the fastest car on the track, but this time, I didn't take the passive approach; no one would pass the G-Man without a battle!

I pushed, scraped and dodged cars during the entire first half, but toward the end, I found some breathing room as cars dropped out due to technical difficulties. My RTR Nitro was still going strong, however, and I soon matched the leaders' pace; I eventually finished fourth that day by beating more than a dozen with a car that I had not built. I don't doubt that the RTR Nitro was

> designed by racers because it ran like a dream.

FINAL THOUGHTS

With the release of HPI's RTR Nitro, nitro touring-car

FACTORY OPTIONS

- · Super shocks-part no. A111.
- Universal dogbones (F/R)—A513 /A514.
- . 39-tooth ball diff-Agos.
- Front belt tensioner—A96o.
- · Ball bearings for steering posts-Bo17.
- Stainless-steel hinge-pin set—A261.
- · Tuned pipe and exhaust header-A970.
- 39-tooth, Super one-way front diff—A959.
- · Fiber brake disk-A844.
- Woven-graphite shock towers (F/R)-570/A218
- 2-speed transmission—A910.

racing just became easier and more economical.

If you're ready to enter what just might become the racing class of the new millennium, take a long and serious look at the new HPI RTR Nitro RS4. Oh, and let me go on record as stating that "RTR" should henceforth stand for "ready to race"!

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

EAR

 Team Orion* 6V, 1000mAh nickel-metal-hydride receiver battery pack . O'Donnell* 20% racing fuel . OFNA* alkaline glow igniter • HPI fuel bottle • HPI Pro-compound belted Super Slicks with medium-compound molded inserts . Prather* after-run oil

THE COMPETITION

	Traxxas 4-Tec Nitro RTR	HPI RTR Nitro RS4
Deposit visites	Haxas 4-let Millo hin	HEININ MILLO NO.
Wheelbase	10.2 in. (259mm)	10.5 in. (268mm)
Width (F/R)	7.8 in. (198mm)	7 in. (179mm)
Weight	63 oz. (1,786g)	58 oz. (1,644g)
Diff type	Planetary gear	Bevel gear
Brakes	Disk	Disk
Exhaust	Plastic tuned pipe	Plastic tuned pipe
Price	\$359.99	\$519
Available at*	\$309	\$309
Issue reviewed	04/99	04/99
*Prices vary with le	ocation.	



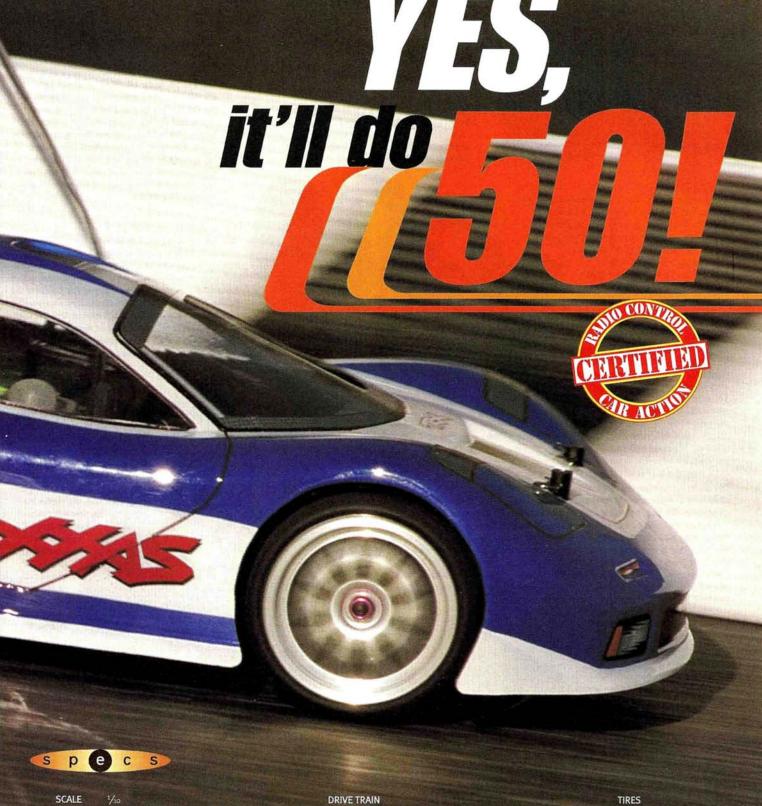


GAR ACTION



by Doug Huse

hen the Traxxas* team decided to enter the 4WD nitro sedan market, they did it in a big way—the Traxxas way! The folks at Traxxas always seem to ask, "How do we make it bigger, badder and faster?" Enter their all-new nitro land missile: the Traxxas Nitro 4-TEC 4WD Sedan. Land missile? What else do you call a car that boasts speeds of 50mph+ right out of the box?! If you're thinking that Traxxas just converted an electric 4-TEC guess again; the Nitro 4-TEC is all new. Take a look; I think you'll be impressed.



LIST PRICE

\$359.99 (\$299.99

w/o radio)

DIMENSIONS

Wheelbase 10.2 in. (259mm)

Width (F/R) 7.8 in. (198mm)

WEIGHT

Gross, RTR 63 oz. (1,786g)

CHASSIS

Type

Double-deck plate

Material Aluminum lower

plate/plastic upper deck

Type

Belt

Primary Clutch bell/spur gear Drive shafts Telescoping universal

Differential(s)

Planetary gear

Clutch

Centrifugal 2-shoe

Bearings/bushings Bearings

SUSPENSION (F/R)

Type Damping Double wishbone

Plastic, oil-filled,

coil-over shocks

WHEELS

Type Molded, one-piece mesh

Pro-Line V-Rage Type

POWERPLANT

Traxxas TRX .15 Engine

Rotary Carb

Plastic tuned type

RADIO GEAR

Transmitter Traxxas Qualifier

Steering/throttle servos Traxxas 2018

TRAXXAS NITRO 4-TEC RTR



2-SPEED, 3-BELT DRIVE TRAIN

The 2-speed transmission is arguably one of the hottest hop-ups for nitro sedans; naturally, Traxxas includes it as standard equipment. The tranny is spun by a heavy-duty, ball-bearingsupported clutch bell that features quick-change gears, and that means you can change gear ratios without having to buy a complete clutch bell. Power is sent front and rear by the industry-proven triple belt. The rear belt tension can be adjusted by rotating the diff on a cam-mount system, and the front can be adjusted by placing shims under the front bearing blocks. Center belt tension-very tight from the factory-is not adjustable. The front and rear differentials are four-gear, planetarytype units that should prove bulletproof. Power is sent to the wheels by telescoping plastic universal drive shafts.

COUNTERSUNK BLUE CHASSIS

plete set of sealed ball bearings.

Finally, the 4-TEC's driveline is complemented by a com-

The chassis is a blue-anodized 2.5mm-thick aluminum plate (complete with countersunk screws) and an upper plate of hard plastic composite. The upper chassis assembly consists of a complex arrangement of braces and stiffeners, and all the components are thoughtfully tied together, including the engine mount. This results in an assembly that is one of the most flex-free, if not the most flex-free, I have seen. Set down low in the chassis' centerline is the 75cc fuel cell, which is rubber-isolated from engine and driveline vibration to reduce fuel foaming. In this position, the left-to-right weight bias is not affected by fuel consumption and thus gives more consistent handling during a run.

YOU'LL NEED

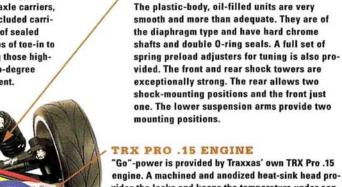
- Polycarbonatecompatible paint.
- 7.2V rechargeable
 Ni-Cd battery pack
 with charger.
- Glow-engine fuel.
 12 AA hatteries.
- Spare glow plug(s).
- · CA to glue the tires.

FACTORY OPTIONS

- Titanium hingepin set-part no. 4839X.
- Titanium turnbuckles—4841X.
- Graphite upper deck—4823X.
 - rear brake-4826X.
 - brake disk-4884X.
 - rear shock tower-4317X.
 - tie bar-4832X.
- Big-bore shocks (short) (hard-anodized and Teflon-coated T-6 aluminum) w/springs (F/R) (2)—2658.
- Tire inserts, molded (hard, black)—4879.
- Swaybar kit (F/R)—4875.
- Steel output yokes (2)-4628X.
- Aluminum tuned pipe/header (complete w/mounting hardware), blue anodized — 4486.
- Pro ball differential—4840.

REAR SUSPENSION

Lower A-arms with turnbuckle upper camber links keep the rear axle carriers, or uprights, in place. The included carriers, which also house a set of sealed bearings, provide 1.5 degrees of toe-in to stabilize the rear end during those highspeed runs, and a set of zero-degree carriers as optional equipment.



ULTRA SHOCKS

Traxxas black Ultra shocks provide damping.

"Go"-power is provided by Traxxas' own TRX Pro .15
engine. A machined and anodized heat-sink head provides the looks and keeps the temperature under control, while a ball-bearing-supported crankshaft with a
bronze-bushed aluminum connecting rod transfers the
power. Fuel is delivered via a large-bore, rotary-valve
carb that has high- and low-end mixture-control needles. Exhaust is routed through an aluminum header
pipe and a rubber connector tube out through
the composite tuned pipe.

EZ-START SYSTEM

If you don't like to carry a starter box and dislike having to remove the body to get to your pull-starter and glow plug, you'll like the included EZ-Start. It consists of an electric motor with a gear-reduction unit to turn over the engine while igniting the glow plug. Just plug the starter unit in, press the button, and fire it up! The cool factor

alone totally outweighs the added weight in the chassis (pun intended).

WHEELS AND TIRES
The nicely finished satin-silver mesh wheels,

HIGH-PERFORMANCE

S-2-compound, V-Rage sedan tires.

are topped off with Pro-Line's* super-sticky

PIVOT-BALL FRONT SUSPENSION which are industry-standard 12mm hex drive,

The fully adjustable front suspension has upper and lower A-arms that are mounted on top with screw pins and at the bottom with step pins and are

retained with E-clips. For added strength, there is also an FRP tie plate that runs between the front lower hinge pins. Caster is adjusted without having to disassemble the upper arms by using easy-to-remove spacers, while camber is handled by a turnbuckle. What really caught my eye were the steering blocks and pivots balls. The pivot balls are actually true upper and lower ball joints that have no purpose other than to provide a solid, yet smooth, mounting platform for the steering blocks—very nice. The steering blocks feature metal inserts for the ball-joint mounting screws. This adds up to one solid front end! The steering system consists of a bellcrank with ball links everywhere (no music wire here) and turnbuckle tie rods for quick and easy toe adjustments.

TEST GEAR

 Traxxas Top Fuel • Trinity* 1400mAh Amp Max battery (used to operate EZ -Start).

TRAXXAS NITRO 4-TEC RTR

PERFORMANCE

Time to pack up all my gear for a test run. What gear? The only thing I need is fuel. No starter and no glow-plug heater. But, since this is break-in, I'll take an extra glow plug, just in case.

Follow the instructions when you break in the engine. It may seem tedious, but the payoff is an excellent-running and long-lasting engine.

After I had given the carb a good prime, I hit the starter quickly a couple of times, and the engine fired right up. When breakin was finished, I dialed in the tranny. Personally, I like my shift point a little short, about 2/3 to 3/4 of maximum rpm.

The Traxxas Pro .15 engine ran without missing a beat at anywhere from idle to full bore down the straight. The carb exhibited excellent mid- and high-range characteristics with just an occasional hiccup at low end-something a little extra tweaking easily eliminated.

On the pavement, I found the chassis to roll a little too much, which caused it to lean and spin out. Handling wasn't helped when the tires pulled away from the rims due to the chrome plating (see "Building and Setup Tips"). I continued the test with a set of slightly smaller diameter HPI tires. During high-speed testing, I discovered the radio is outperformed by the car; the Top Qualifier radio is capable of controling the car, but the servos don't center as precisely as they should for a car as fast as the Nitro 4-TEC. In addition, play in the stock servo saver causes the car to wander.

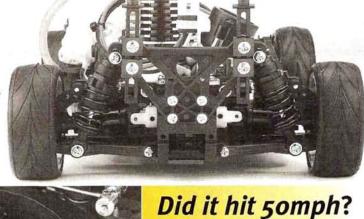
Even if you are an experienced R/C'er, go over the instructions carefully. A

BUILDING & SETUP TIPS

little extra knowledge goes a long way.

- Take extra care when you glue the tires, and be sure to scrape the plating from the rims' bonding area before you glue. Losing a tire at high speeds can be a very bad thing.
- Take a few minutes to double-check the tightness of all screws. Remember, humans build these things, and no one is perfect!
- When you adjust the transmission shift point, be very careful about which screw you turn. Loosen or tighten the screw on the angle to change the shift point. The screw that goes straight through the assembly holds the unit to the shaft. A mistake here can cause complete tranny failure.
- If the EZ-Start system sounds labored or slow even when fully charged, don't force the issue. Stop and check it out. In most cases, the engine is simply flooded. Remove the glow plug, turn the crank a few times with the EZ-Start, then reinstall the plug.
- After the break-in period, double-check everything before you really let loose.

Right: strong front and rear telescoping universal drive shafts are standard equipment. Bottom: the included 2-speed transmission features quick-change gears and offers excellent acceleration and blistering top speeds.



The front suspension has upper and

lower ball joints instead of kingpins. Shims in the upper arms may be moved

to set caster.

t was time to see whether the Nitro 4-TEC could reach the speed that Traxxas boasts. I met with RCCA's senior editor Steve Pond at Sikorsky Memorial Airport to

clock it with a radar gun. I made a few passes

down the runway to get the engine up to temperature and set the mixture.

Steve pulled the trigger on his radar gun as I pulled the trigger on the transmitter; it hit 47mph. Impressive, but not 50. I leaned the mixture a bit more for another pass and got a bit more speed. The

slightly smaller tires I installed changed the car's final drive ratio, which didn't help the car's speed, but we did hit the magic mark! The Nitro 4-TEC did a radar-certified 50mph, as promised. However, it took every bit of radio range the Qualifier transmitter could offer to reach full speed. With the kit tires, the car's speed might have surpassed the 50mph point. Impressive for any car, but especially for a ready-to-run!

A little steering correction was required to get the car to track straight after a turn. A better servo is the best fix, but simply installing a Kimbrough servo-saver helps quite a bit. Watch your range, also. The Nitro 4-TEC can cover a lot of ground in a short time.

 Extremely thorough instructions and parts breakdown.



- Super-solid front suspension.
- · Pro-Line V-Rage tires.
- Countersunk screw-holes in chassis.
- Excellent hop-up list.
- Onboard electric starter.

 Belt or diff dislikes replacement/repair requires major chassis disassembly.

· A bit of play in the steering servo-saver.

THE COMPETITION

	Traxxas 4-TEC NITRO RTR	HPI RTR NITRO RS4
Wheelbase	10.2 in. (259mm)	10.5 in. (268mm)
Width (F/R)	7.8 in. (198mm)	7 in. (179mm)
Weight	63 oz. (1,786g)	58 oz. (1,644g)
Diff type	Planetary gear	Bevel gear
Brakes	Disk	Disk
Exhaust	Plastic tuned pipe	Plastic tuned pipe
Price	\$359.99	\$519
Available at *	\$309	\$309
Issue reviewed	4/99	4/99

FINAL THOUGHTS

Do you have the need for speed? Are you looking for bragging rights? Does the thought of tedious assembly make you cringe? Consider the Nitro 4-TEC. From the "big-block" .15-size engine to a chas-

sis that is ready to run, fast and a real blast to drive, Traxxas' latest has it all. For high-speed parking-lot action, pick up the RTR, and the next time someone walks up to you and asks how fast it is, you can say, "It'll do 50!"

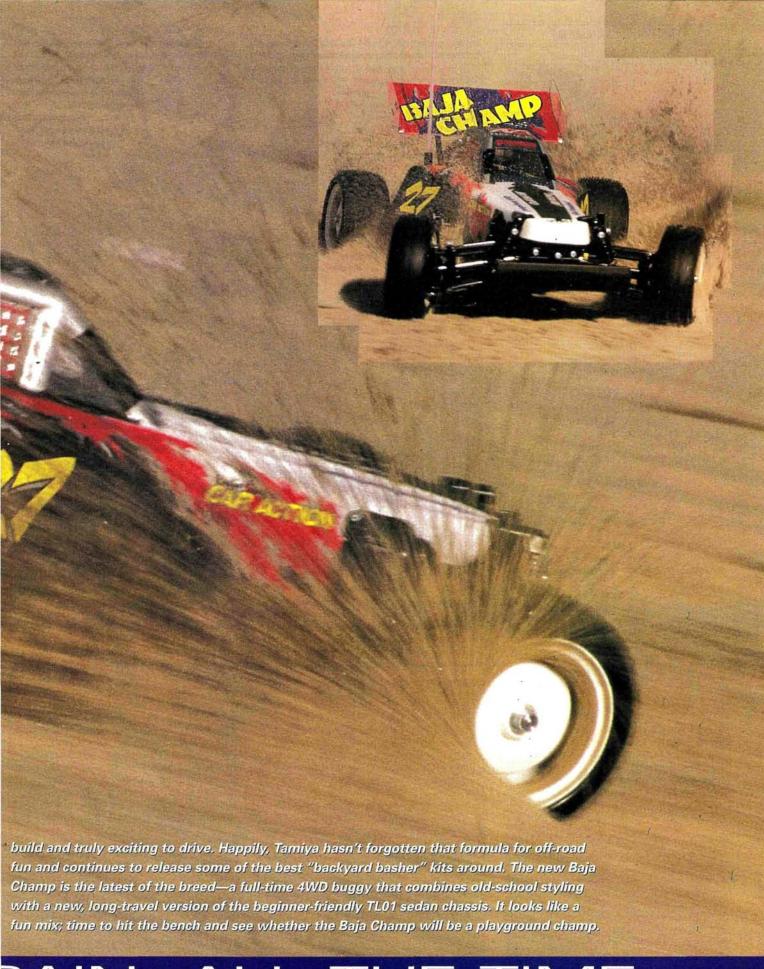
*Addresses are listed alphabetically in the Index of Manufacturers on page 209.



Tamiya **Baja Champ**

by Peter Vieira

Despite the longevity of the Blackfoot and Clod Buster chassis and the recent proliferation of "TA" series sedans, I still think of buggies as Tamiya's* signature vehicles. After all, early machines such as the Frog, Hornet, Hotshot and a host of other Tamiya openwheel off-roaders were the real fuel behind the first R/C boom. And with good reason: they were rugged, reliable, easy to



RAIN, ALL THE TIME

TAMIYA BAJA CHAMP









SCALE 1/10 LIST PRICE \$132

DIMENSIONS

Wheelbase 10 in. (254mm) Width 9.7 in. (246mm)

WEIGHT

Gross, RTR 54.7 oz. (1,551g)

CHASSIS

Type Monocoque Material Molded plastic

DRIVE TRAIN

Sealed gear Type Primary Pinion/spur Dogbones **Drive shafts** Differential(s) Bevel gear Bearings/bushings Bushings

SUSPENSION (F/R)

Type Lower A-arm/fixed

upper link

Damping Plastic, coil-over shock

WHEELS

Type Molded one-piece Dimensions (F/R, DxW) 60x30mm/60x40mm

TIRES

Hard-compound spikes

ELECTRICS

Mabuchi 540 Motor Battery Trinity Amp Max II (not included)

ESC 3-step mechanical

YOU'LL NEED

- · 2-channel transmitter and receiver.
- . Two servos (if you use the included mechanical speed control), or one servo and ESC (preferred).
- · Polycarbonate-compatible paint.
- · Stick-type, 6-cell battery.
- · Charger.

FACTORY OPTIONS

- · Low-friction aluminum damper set (pair only) part no. 53155.
- Super low-friction aluminum damper set (4) part no. 53280.
- On-road tuned-spring set —53163.
- TA03 ball differential—53267.
- Ball-bearing set—53292.
- Hollow-carbon gear shaft—53322.
- Carbon propeller shaft—53323.
- Speed-tuned gear set—53342.
- Toe-in rear uprights 53345.
- Quick-release battery holder—53346.



You don't see aggressive knobs like Baja Champ's anymore; don't you miss them? These meat tenderizers look as if they could eat today's "fuzzy" tires for lunch! The hard-compound rubber and open tread pattern are effective in soft, loamy stuff and work well on short grass as well-your basic backyard terrain. If you wish, you can mount aftermarket tires from Pro-Line* and Losi*, since the Champ uses standard 2.2-inch rims.

TL01B CHASSIS

Look familiar? With its sealed integral gearboxes and tough, molded-in shock towers, Tamiya's superstout TL01 sedan platform looks like a natural off-roader. The clamshell chassis halves, transmission internals, gear differentials and heavy-duty shaft drive are standard TL01 parts, while the two-piece suspension arms, TA01-series

front hubs, extra-long dogbones, wide front bumper and wing mounts are new to the "B" version ("B" for

"buggy," presumably).

STICK-PACK BATTERY HOLDER

The Baja Champ's battery tunnel uses body clips to hold a 6cell pack in place. No need to remove the body for pack changes: the pack sticks out from the narrow buggy body's

DIRECT-LINK STEERING

540 MOTOR

The stock powerplant delivers plenty of torque

and long run times, and the top speed isn't bad,

thanks to the taller ratio afforded by the Champ's

large tires. The TL01B chassis

features preset pinion mesh

and accepts 23-, 21-, or 19-tooth

pinions; Tamiya specs a 19-tooth

sedans, which have smaller

just as it does with the TL01

An oversize servo-saver joins the upside-down steering servo to the front hubs via molded tie rods. Amazingly, the setup doesn't show any sign of bump steer!

ONE-PIECE CAMBER LINKS

Who cares if camber isn't adjustable? The 2 degrees of negative camber provided by the stock pieces is fine, and the molded links will never bend or strip.

springs are spec'd for the Baja Champ, the kit's boingers are essentially the same as those of the TL01 sedan. The

shock shafts are pushed and pulled through a lubricated rubber sleeve to provide damping. The system works acceptably in on-road applications, but off-road action is too much for these shocks; there just isn't enough damping, and the suspension bottoms out harshly over the smallest jumps. Oil shocks are a wise upgrade; a set of Tamiya's plastic units is inexpensive and performs quite well.

BUILDING & SETUP TIPS

BUILDING

FRICTION SHOCKS

Although longer shafts and firmer

- Step 2. Be sure the steering servo's output shaft is at neutral before you install the servo-saver and assemble the chassis halves; once they've been assembled, there is no access to the servo. This tip applies to all TLo1-series vehicles.
- Step 7. When lubing the gears, put just a "dot" of grease onto each gear; as the gears turn, the grease will be evenly distributed. Any more grease than this will only add drag. For a super-smooth tranny, try Aero-Car Technology's* Super Speed Gear and Diff lube.
- Step 11. The instructions call for the receiver to be mounted on top of the chassis; for a cleaner look, I prefer to hide the receiver underneath the "shelf" on which the ESC is mounted.
- Steps 15 and 19. Don't put big blobs of grease on the dogbone ends; extra grease will attract dirt and dust. I left 'em dry, but a thin film of lube will help the parts wear better as long as they're kept clean.

SETUP

- There aren't any adjustable features to worry about, so setting up the Baja Champ is a nobrainer. The Champ will, however, handle much better with oil shocks in place. I used a set of Tamiya's super-trick aluminum units, but plastic shocks are more than adequate. Assemble the shocks with 1-hole pistons and fill them with 6oWT oil. Use the kit's black springs with the oil shocks.
- For more straight-line stability, try Tamiya's optional rear hubs, which offer 2 degrees of toe-in. These are very helpful when running hotter motors
- If you decide to mess around with aftermarket tires, don't mix and match tread patterns or brands; if you mix tires of different diameters, you can expect goofy handling and shorter run times.

Convert your TLÓ1 sedan for off-road

OK, all you TL01 sedan owners out there; I know what you're thinking; "Hey, I bet I could convert my sedan to a buggy!" Yep; you sure can.

YOU'LL NEED

- Front uprights—part no.—0445572.
- "C" parts (2 required)-0005688.
- Front wheels—53089.
- Rear wheels—53086.
- MB16 Gearbox plate—4315055.
- MB18 Flanged tube—3585060.
- Body and wing set—1825183.
- MB13 drive shafts (2 required)— 9805370.
- Decal set—9495302.
- Manual—1055833.
- U-shaped shaft—3485068.

Of course, the best bet is to keep your sedan ready to roll and buy yourself a Baja Champ kit; they're so inexpensive that it's hard to justify the expense of the conversion parts! Besides, you can never have enough R/C cars.

TEST GEAR

- . JR Racing* XR2 transmitter and receiver
 - · Novak* Reactor reversing ESC
 - JR Racing Z250 steering servo
 - Trinity* Amp Max II battery

PERFORMANCE

My first run with the Champ took place at a local beach for the "Thrash Test" photo shoot. Sand is notoriously insidious and tends to foul the gears of just about any R/C vehicle I run there. The Baja Champ slogged through the stuff without difficulty, however, and made a good show of churning up the sand with its spiky tires and 4WD.

The resistance of the soft sand made for short run times, but the Champ's sealed integral gearboxes did keep it out of the transmissions. However, a lot of silt collected (harmlessly) in the chassis thanks to the openings for the electronics; I had to empty the car like I emptied my shoes!

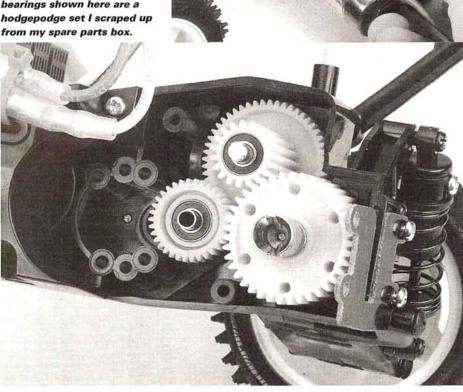
· Requires virtually no maintenance.



- Climbs over or plows through almost anything, thanks to its full-time 4WD.
- · Durable construction shrugs off abuse.
- · Inexpensive.
- Damping is much dislikes too light; suspension bottoms out harshly.
- . Body does not include masking film or window masks.

Right: for lightning-fast pack changes, I installed Tamiya's optional quickrelease battery holder. Trinity's Amp Max II sport packs are the best 1500mAh packs I've tried.

Below: like so many Tamiya vehicles, the Baja Champ has wide, strong gears that will handle a ridiculous amount of abuse. The Champ arrives with a full set of plastic bushings; the bearings shown here are a hodgepodge set I scraped up



The lighting at the beach made for some good shots, but the terrain was hardly challenging, so I set out to find more interesting turf. A nearby park offered plenty of rocks and roots to bounce over as well as a tree whose trunk formed a natural quarter-pipe that made for some "X-Games"-style stunts. Nailed properly, midair U-turns were easily performed, but if I missed the "target" by an inch, the Champ landed on its roof from a 4-foot drop-ouch.

Although lid-first landings were tough on the wing, they were only slightly less painful than touchdowns on all fours, due to the under-damped shocks, which allowed the chassis to slap hard when landing from any height. Despite the abuse, the Baja Champ soldiered on pack after pack.

Stone dust paths crisscross the park, and I found some sweeping turns to slide the Champ through. The buggy's aggressive steering made it easy to pitch sideways, and I was able to drift it through the turns sprint-car-style, thanks to its 4WD system. All-wheel-drive also makes it easy to flatten hills, although more horsepower would allow the Champ to do it with more authority.

THE VERDICT

The Baja Champ proved to be as much fun as I had anticipated, and it showed the durability that has made Tamiya kits popular for years. The "B" version of the TL01 chassis is well suited to this new offroad application and requires no real maintenance beyond the usual post-run dust-off. For all-terrain fun in a coollooking buggy, the Baja Champ really is a champ.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.



Yokomo YR4-M2 Pro

Eugene "Geno" You



SCALE 1/10 STREET PRICE \$495

DIMENSIONS

Wheelbase 9.5 in. (241mm) Width (F/R) 7.25 in. (184mm)

WEIGHT

Gross, RTR 53.6 oz. (1,520g)

CHASSIS

Type Triple deck

Material Carbon-fiber graphite

DRIVE TRAIN

Type Dual belt Primary Pinion/spur

Drive shafts Hardened universals

Differential(s) Ball

Slipper clutch None Bearings/bushings Bearings

SUSPENSION (F/R)

Type Lower A-arm

w/adjustable upper link

Damping Aluminum-body

coil-over shocks

WHEELS

Type One-piece plastic
Dimensions (DxW) 24x48mm

TIRES

Type Yokomo Sprint (firm compound)

Inserts Yokomo (firm foam)

ELECTRICS

Not Included

*Price varies with location



t's been a few months since we showed you the "First Look" on Yokomo's* new YR4-M2 Pro 4WD touring car (January '99). Since then, this car has caused quite a stir in the racing ranks. The Pro has already proven itself a competent performer by winning the Invitational class at the Reedy Touring Car Race of Champions and the Factory Modified class at the NORRCA Road Course Nationals. I'd say that's a good start, wouldn't you?

Masami's Factory Ride

To prepare the car for evaluation, I called on Yokomo's USA team drivers, and Frosty St. Clair and Tony Phalen agreed to help set up the car. Is the production version as potent as the prototype? Only wrenching and driving time will tell. I invite you to join me as I take Yokomo's latest Samurai out for some hot laps.

■ Page 8—step 2. Do not mix the aluminum screws with the steel screws. If

BUILDING & SETUP TIPS

you thread an aluminum screw into the aluminum bulkhead, it will be nearly impossible to remove later.

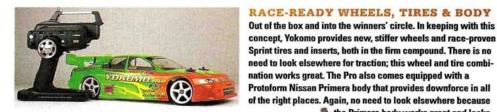
- Page 9-step 2. Use 12 balls in the diff, as recommended in the update sheet, instead of the six specified in the instruction manual. This will ensure smoother action and prolong the life of the diff.
- Page 15. After you have secured the shock piston to the shaft with the two E-clips, check for vertical play. I had to shim one piston because of excessive play.
- File down all the sharp edges on the bottom chassis, and apply CA to them to further protect the chassis. Roll up your sleeves and sand the edges off all eight slots as well. Remember not to breathe in carbon-fiber dust; wear a mask or sand the chassis under running water.
- Get a pair of decent calipers. Eyeballing measurements does not cut it in on-road racing. Half a millimeter makes a tremendous difference, so calipers are a wise investment.
- Be sure the front left and right and rear left and right shocks are of equal lengths.

YOU'LL NEED

- . High-quality, 2-channel transmitter and receiver.
- One servo (preferably high speed).
- . FSC.
- · Motor.
- · 6-cell saddle-pack battery pack (3x3 or 4x2 configuration).
- · Polycarbonate-compatible paint.
- Double-sided tape.
- · CA glue.
- . Strapping tape (for the battery).

FACTORY OPTIONS

- · o-degree front block carriers, o/3/5-degreepart nos. ZC-4130/ZC-413/ZC-413C.
- - -steering tie rods-ZC-TB16.
 - -camber rods-ZC-TB20.
- Factory torque rod for the 3/7-degree blocks— ZR-007TR3/ZR-007TR.
- · Factory blue-aluminum
 - -lowered center shaft-ZR-304J-2.
 - EZ hubs-ZR-0115.
- Ball-bearing steering-ZC-201.
- . Pro Series racing spring set
 - -Blue (20.0 rate) -YS-2-BLU.
 - -White (25.0 rate)-YS-2-WHT.
 - -Yellow (30.0 rate) -YS-2-YEL.
 - -Green (35.0 rate) YS-2-GRN.
 - -Black (40.0 rate) -YS-2-BLK.



IMPROVED DRIVE TRAIN

The Pro's diffs use 12 diff balls instead of six as on the previous design. This makes the diffs work more smoothly and last longer between rebuilds. Eight thrust balls with high-quality thrust washers complete the package. The diffs can be adjusted without major disassembly. Twenty-four high-quality ball bearings ensure a friction-free drive train. Yokomo went an extra step by providing rubbersealed bearings for the wheels and bearings for the rear belt guide and front belt tensioner.

ADJUSTABLE UPPER DECK

One end of the V-shaped upper deck is secured directly on the front bulkhead while the opposite end is mounted on aluminum posts that are bolted to the graphite cross-brace. The chassis is allowed to flex laterally toward the middle and rear of the chassis; flexing can be adjusted by altering the preload on the in-line-mounted coil-spring shock. This is similar to the system used on Yokomo's MX-4 off-road buggy.



Hardened-steel universals are on all four corners. These babies are strong and precise! There is absolutely no need to upgrade here; however, I opted to install lightweight MIP* aluminum CVDs to reduce rotating mass for stock-class racing.

the Primera body works great and looks

cool mounted on the chassis.

VERSATILE MAIN CHASSIS PLATE

The Pro features a unique triple-deck carbon-fiber chassis. The lower plate features four battery slots on both sides of the chassis that allow the cells to be mounted in a number of ways, including the 4x2 configuration shown here. A graphite cross-brace is secured just in front of the motor mount and helps eliminate some of the unwanted side-to-side flexing.

BELLCRANK STEERING

The Pro uses a proven, dual-bellcrank steering system with built-in servo-saver. Optional ball bearings can be added to the bellcranks for even smoother action.

BLUE ALUMINUM HARDWARE

Trick-looking, blue-anodized aluminum pieces are found everywhere on the M2 Pro. The two-piece front bulkhead, chassis posts, tension spring clamp on the in-line shock, the motor mount and center shaft support are all blue-anodized. In addition, every piece has been milled out to reduce weight without sacrificing strength. I decided to add OFNA* aluminum conical spacers throughout to accent the color scheme.

FRONT BELT TENSIONER

A ball-bearing-equipped front belt tensioner is provided, but I hope that Yokomo will include an adjustable unit in future kits.

· Cool, blue-anodized aluminum parts are everywhere.

HEAVY-DUTY

TOURING SHOCKS

Hard-anodized aluminum-body shocks are

caps feature a special bleeding hole that's

Removing the screw allows quick and precise shock-fluid bleeding. Teflon pistons and

factory-installed seals ensure smooth and

consistent action from one race to the next.

standard issue on the M2 Pro. The shock

sealed with a small self-tapping screw.

- likes
- · Versatile eight-slot lower chassis plate.
- · Race-ready wheels and tires.
- · Functional transponder mount.
- Kit includes Protoform racing body.
- I hate using strapping a dislikes tape to mount batteries. I miss the M2 USA's hassle-free battery mounting.
- . The suspension arms and caster blocks flex quite easily; Yokomo should have included the optional torque rods with the kit to eliminate suspension

 LRP* V6 electronic speed control • Airtronics* mini FM receiver • Airtronics 94157 high-speed servo • Yokomo "Plus 2" RC2000 matched cells • Yokomo 10 Triple Zero M3 Super Touring modified motor • Protoform* Nissan Primera body custom-painted by Todd Amann • Dan's R/C* battery straps

PERFORMANCE

The YR4-M2 Pro was tested at two tracks in Southern California: So-Cal Raceway in Huntington Beach and California R/C Center in Anaheim. These tracks allowed me to test the Pro's tunability to the max.

So-Cal has a huge straightaway that almost completes an entire oval lap then heads into an intricate infield that requires both throttle control and good roll speed. Horsepower and punch were the order of the day, and after a couple of slow laps, it was showtime.

Opening up the M2 down the straightaway was madness, as the vehicle shot forward like a missile. I desperately tried to monitor the drive train by listening, but I had a difficult time because the car was virtually silent. I did not even let off going into the sweeper, and the M2 Pro followed my line-no signs of push or washing out the rear-so far, so good.

The Pro really made its mark in the infield as it sliced and diced through the corners with precision. Team Yokomo driver and R&D pro Frosty St. Clair was there to witness my first run. He relaxed a little as he realized that driving strapped out of my mind was my natural style! As Frosty took the Pro back into the pit, he told me to change the shock oil to 80WT up front and 60WT in the rear. This offered a more balanced feel that ultimately made the car more stable.

The Pro was ready for competition, and at California R/C Center, competition was everywhere-all the West Coast factory top guns and local fast guys. Parkinglot racing was very serious that day, and I definitely had my work cut out for me.

The M2 Pro was ready, however, as I took the win on the first qualifier and placed fifth on the second. Locked into the A-main in fourth place, I was very pleased with the M2 Pro. The A-main spelled disaster for me, though: careless preparation resulted in my losing the left rear wheel when I was in third place. I let my M2 Pro down that day because of a rookie mistake, but I walked away knowing that I could have finished very well.

FINAL THOUGHTS

The Yokomo YR4-M2 Pro is a serious racing machine right down to its tires. Out of the box, if you're a serious racer, this car could take you to the winners' circle.

The two-piece, blueanodized front bulkhead stiffens the front suspension dramatically. Hardened universal drive shafts and a competition front bumper are now standard, as are the Sprint tires. Check out the graphite shock tower: as you can see, several shock- and camberrod mounting choices are available.





Above: the cool, blue-anodized motor mount is included with the kit. Check out the ball-bearing belt guide. The motor mount has been machined to reduce weight. Yokomo offers a lowered motor mount that lowers the layshaft considerably to reduce the car's CG. I'll stick with the stock one

because it simplifies battery mounting and allows a broader range of spur-gear choices.

Below: hardened universals, a graphite shock tower and Sprint tires are found back here, too. The rest of the suspension is all M2 USA. Note the Allen-head screws used throughout. To stiffen the rear end, I glued two shock towers together with CA and installed this custom, double-ply shock tower. This is one of the factory pro tricks.

The Pro was born in Japan, but Yokomo USA provides all you will ever need to keep it sharp and ready to win in the U.S. If you're in the market for top-shelf performance, the Yokomo YR4-M2 Pro just might be all you need to dust off your competition.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

THE COMPETITION

	Team Losi STREET WEAPON	Yokomo YR4M2 USA	Kyosho TF-3 TYPE R	HPI RS4 PRO	Schumacher SST PRO '99	OFNA Z10	Roadrunner XPRESS PRO
Wheelbase	10.19 in. (259mm)	9.94 in. (252mm)	10.1 in. (257mm)	10 in. (254mm)	10 in.(254mm)	10.15 in. (258mm)	10.25 in. (260mm)
Width	7.25 in. (184mm)	7.19 in. (183mm)	7.5 in. (191mm)	7.4 in. (190mm)	7.25 in.(184mm)	7.48 in. (190mm)	7.4 in. (187mm)
Diff type	Ball	Ball	Ball	Ball	Ball	Ball	Ball
Chassis	Composite	Graphite	Graphite	Graphite	Fiberglass **	Graphite	Graphite
List price	\$349.95	\$380	\$399.99	\$329	\$369	\$379.95	\$450
Available at*	\$225	\$229	\$290	\$260	\$225	\$215	\$289
Reviewed in	12/97	11/98	2/99	10/97	4/99	4/97	4/97
Partial list only;	product category is too la	rge to list all competitive	e vehicles *Prices va	ry with location. **	Fiberglass-reinforced	plastic	YAREA



OFNA Pirate 10 Evolution

by Derek Buono

Anyone who has paged through a grammarschool science book has seen the classic illustration of the evolution of man: from scrappy monkey to hirsute Cro-Magnon to modern homo sapiens (who usually resembles a bearded Charlton Heston). R/C cars have undergone similar changes, particularly in the ranks of nitro vehicles. OFNA Racing* has its own theory of evolution, as shown in its Pirate 10 Evolution—a rework of the sport-minded Pirate 10. Although that car was

no knuckle-dragger, the Evo version is certainly a cut above. Has OFNA reached the top of the evolutionary ladder with its latest Pirate?



Scale ½0 List price \$375.95 Available at \$249.99

DIMENSIONS
Wheelbase 10.63 in. (270mm)
Width 9.84 in. (250mm)

WEIGHT Gross, RTR 67.2 oz. (1,905g)

CHASSIS
Type Double-deck w/channeled bottom plate

Material T6 aluminum

DRIVE TRAIN

Type Shaft-drive w/3 steel bevel-gear diffs
Primary Clutch bell/spur
Drive shafts Universal joint
Differential(s) Steel bevel gear
Clutch Centrifugal
Bearings/bushings Full bearing

SUSPENSION (F/R)

Type Lower A-arm w/adjustable upper camber links

Damping Oil-filed, coil-over aluminum-body shocks

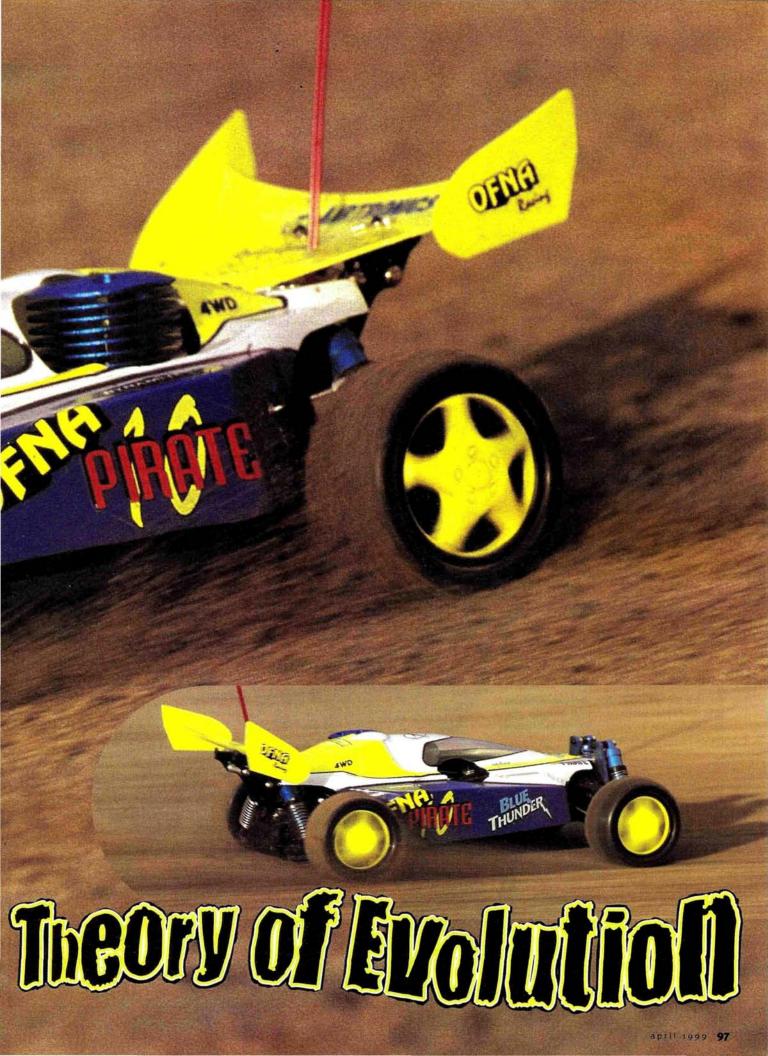
WHEELS Front/rear Solid design w/five

star caps

TIRES
Front/rear Non-directional mini-pins

POWERPLANT

Carb Slide carb
Pipe Tuned pipe
Fuel Dynamite Blue
Thunder





With its many louvers and hard edges, the Pirate 10 Evolution definitely has a Buck Rogers look. The molded plastic wing has a hole in the center for the antenna to pass through and also looks unique (think boomerang).

TIRES AND WHEELS

The Evolution comes with soft-compound mini-pin tires that provide good traction. Less appealing are the black plastic wheels and their press-in hub caps that tend to pop out when the going gets rough. During the testing, a hub cap occasionally jumped ship and rolled ahead of the car; there's nothing worse than getting beaten by your own

MOLDED RECEIVER TRAV

hub cap.

The plastic radio tray is designed to secure the receiver pack. The Dynamite* 5-cell pack I used fit well and didn't budge during testing.

BLUE ALUMINUM CHASSIS

The attractive, stiff, double-deck aluminum chassis features countersunk screws for a smooth no-snag bottom. The 75cc fuel tank is cleverly molded to take full advantage of the available chassis space.

BELLCRANK STEERING SYSTEM AND ALUMINUM SERVO DECK

The bellcrank-type steering was smooth and trouble free from the factory. The aluminum servo tray provides the proper mounting position for both the steering servo and the throttle servo. Adjustable tie rods allow you to set the right amount of toe-in or toe-out, which will depend on your driving characteristics.

CVD-TYPE DRIVE SHAFTS

Although not genuine MIP units, the Evo's imitation drive shafts function well and are smoother than conventional universals.

- · Low cost; high performance.
- · Comes 90-percent assembled.
- Includes many parts often considered to be hop-ups in other kits.

*likes

YOU'LL NEED

- · 2-channel radio with 2 servos.
- .12 or .15 engine.
- . Starter box or bump starter.
- · Fuel.
- · Glow-plug igniter.
- · Thread-locking compound.
- Polycarbonate-compatible paint.

DOUBLE-WISHBONE SUSPENSION

The Evolution features double-wishbone suspension with oil-filled, coil-over shocks for damping. The cast-aluminum steering knuckles are attached directly to the arms by means of large pivot balls. The upper links are adjustable and allow front and rear camber adjustment. Aluminum tie bars on both ends protect the bulkhead and arms from breaking on impact. A rear swaybar is sup-

plied.

BUILDING & SETUP TIPS

The Pirate 10 Evolution arrives 90 percent assembled, but engine installation is left to

its owner. Installing the engine proved to be more difficult than I bargained for. The instructions aren't as clear as they should be, and that made the final assembly of the throttle linkage unnecessarily frustrating; for example, an addendum sheet with a single blurry picture is all that guides the builder through the throttle-linkage setup.

- I used Loctite* on the metal parts that I assembled myself, but I decided not to put any on the factoryassembled parts because I wanted to see how well the car would hold together. I'm pleased to report that during the time I ran the car, I had no problems with screws vibrating loose.
- Before installing the engine and routing the wires to the receiver, remove the top brace, fuel tank and receiver tray. You'll simplify the job and have a neater finished product.
- The included shock oil was too light to use with the supplied springs; I refilled the shocks with Associated* 35WT oil.

FORCE .15 ENGINE

I chose a Force Racing* .15 nitro engine with slide carb. This little monster provides big power in a small package. For maximum power and lower operating temperatures, tuned pipe, manifold and coupler are included with the Evo.

HIGH-STRENGTH SHAFT DRIVE SYSTEM

The Pirate 10 Evolution uses plenty of steel in its drive train-most notably in the spiral-cut pinion and diff ring gears. Plain bevel gears in steel would have been more than adequate, but the superior spiral-cut pattern is a real bonus. The differential's internal gears are also steel. The center differential is mated to the front and rear transmissions via aluminum drive shafts and provides worry-free operation with minimal need for maintenance. Full bearings are supplied.

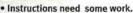
VENTED BRAKES

To stop the car, a vented brake disk is captured by padded plates and activated by a single, cam-style post. The center brake design delivers equal braking power

to both ends of the car.

Airtronics* M8 transmitter and receiver •

Airtronics 94102 throttle servo • Airtronics 94738 steering servo . Dynamite 5-cell receiver pack • Blue Thunder * 20-percentnitro fuel . OFNA Racing universal starter box.



Front arm broke during testing.



PERFORMANCE

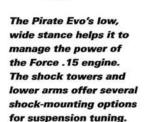
I tested the Pirate at the local track, JP's Hobbies in Derby, CT. The track is bumpy and has large jumps and tight corners, and it proved to be a good test of the Pirate's capabilities. The Force engine was a little cranky in the beginning but woke up after some break-in time and a few tweaks from the "hinge boy," Kevin Hetmanski, and me.

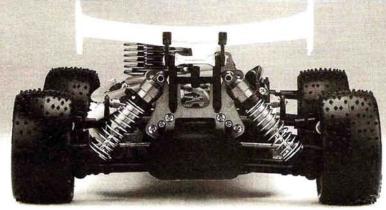
The buggy's first lap was very encouraging. It showed a very tight turning capability, and that surprised me, since 4WD machines like the Pirate Evo generally don't turn as well as 2WD cars. I found the rear damping a bit light, so I made a mental note to add heavier oil later. Jumping required significant midair throttle to level the chassis, which tended to nose over if left unchecked.

After a couple of tanks, I began to lean the engine out, which led to faster speeds and more hang time over the jumps. I managed to pop the steering hubs' ball ends out of the suspension arms a few times, but they were easily squeezed back in. I was sidelined, however, when a front A-arm broke going through a rutted Right: CVD-style drive shafts ensure smooth power transfer to the wheels. The Evolution has a pivoting steering knuckle that is attached directly to the arm. The blueanodized aluminum dampers are effective.

Below: The Evo's steel main gear and clutch bell are welcome, wear-resistant features, and when matched to a suitably strong servo, the vented steel brake disk provides plenty of stopping power.







Pirate 10

If the Evolution is too rich for your blood, check out the "standard" Pirate 10.
Although it costs less than the Evo, it is well-equipped and even includes a 2-speed transmission.
Plastic shocks and telescoping universals sacrifice little in performance as they trim cost, and sweet-looking 3-spoke wheels are standard. An exhaust system is also included; just add your radio gear and a .12 engine.
List price—\$310.95; street price—\$189.99



section; the arm broke cleanly at the pivot ball. I stole an arm from a standard-issue Pirate 10 and was able to head out for more testing later in the week.

The engine continued to impress me with its incredible power; compared with the .12 engines more commonly used in 1/10 cars and trucks, the .15 definitely has an advantage. The throttle response is instantaneous and the speed is very impressive. The engine did, however, develop an erratic idle because of an air leak in the carb, and it stuck at full throttle four times during its first 30 minutes of running. I cured the air leak with a cleaning and careful reassembly and did some creative bending and tinkering with the throttle linkage so they wouldn't bind.

FINAL THOUGHTS

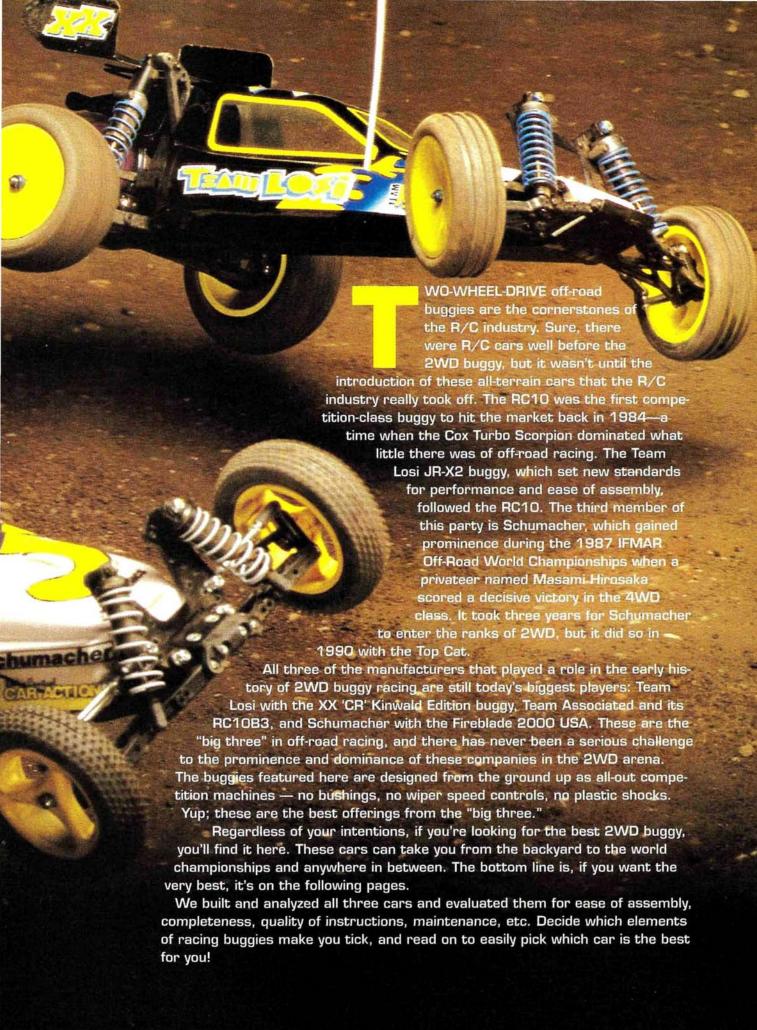
The Pirate Evolution is impressive with the grossly excessive power of a .15 rear-exhaust nitro engine, but it's my opinion that the car's front suspension needs work, as evidenced by the occasional popped-out ball end. The OFNA Force .15R engine can pump out some serious power, but that power only makes the throttle-sticking problems I experienced scarier. The absence of clear instructions further complicates matters; the car comes assembled, but you'll occasionally need to disassemble it for maintenance and repair. Without a manual, the job becomes needlessly complex.

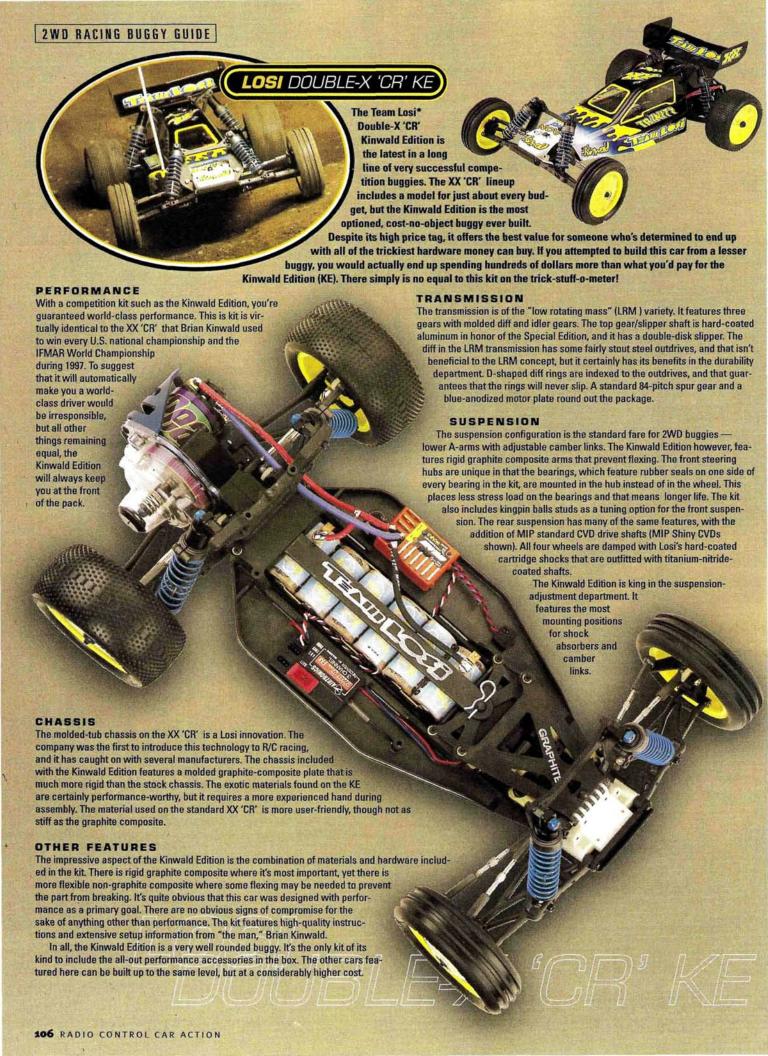
There isn't a class for this type of car at national levels of competition, but you may be able to find a place to run it at your local track—if you intend to race at all. Whatever your intention, the Evo is a fun, fast car. Certain aforementioned areas require some attention from the car's manufacturer, but assuming these get sorted out, the Evo should be quite a blast!

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

2WD COMPETITION BUGGY GUIDE

by the staff of R/C Car Action







TRANSMISSION

The B3 uses the proven Stealth tranny, which was recently revised to deliver a 2.4:1 drive ratio for compatibility with the T3 truck. Associated's 3-gear design with bottom-mounted diff has become standard issue for 2WD off-road vehicles, and the B3's is probably the smoothest. A steel top shaft and top gear are combined with plastic idler and diff gears, and a new larger-diameter slipper disk is fitted for traction control. MIP CVD drive shafts are also standard.

SUSPENSION

options.

Quadra-symmetric is the concept here; that's Associated-speak for equallength front and rear A-arms. In addition, the front and rear hinge pins are in the same plane. In theory, this adds up to more consistent handling; in practice, it does seem to work. Associated's effective, hard-anodized dampers are as smooth as ever, but the old clamp-style preload adjusters have been replaced by clip-on spacers that are supplied in a variety of thicknesses along with the usual assortment of Teflon pistons. The front suspension utilizes combined kingpin/ball studs on the front hubs, and that helps the B3 deliver a "planted" feel. The B3 offers a conservative number of options for shock and camber-link placement; this may be seen as a limitation to those who like to experiment, or as liberation to those of us who always wonder whether we should be trying a different camber-link hole! Steel turnbuckles with well-defined "flats" allow easy camber and toe-in adjustment. A fiberglass front shock tower is supplied, and the rear unit is molded of rigid plastic. Associated does offer lighter "graphite" parts for the B3, but only as

CHASSIS

The B3's molded chassis is a study in simplicity characterized by large, open bays for the electronics. The steering servo can be installed without modification. A single molded strap holds the battery pack, and pair of foam spacers allows the user to select from three battery positions (of course, you could always slice up the foam for finer adjustments). An aluminum nose plate and tail plate complete the chassis and serve as a wistful reminder of the aluminum-chassis RC10s of old.

imagination (and CAD machines). Cornering is

strictly no surprises with aggressive turn-in, and the

car jumps flatter than a two-day-old soda. Pete ran the B3 with the pack in the full aft position to scrub

off a little steering, but that's a personal call; most will find the B3's stock setup just about ideal for any

conditions short of billiard-table smooth and lunar-landscape bumpy.

OTHER FEATURES

The B3's best "feature" cannot be weighed, quantified, or seen, but it's just as welcome as the trickiest aftermarket part: it's easy assembly. The B3 is the easiest-to-build A-team buggy ever, thanks to lucid, generously illustrated instructions and careful manufacturing. The B3 builds without a hitch, and its modular design makes it simple to remove the transmission and front suspension as complete assemblies. One of the B3's best features doesn't shine through until you pair it with Associated's T3 truck; since both kits use the same tranny, fewer parts are required to maintain both.

UMACHER FIREBLADE USA SE Instead of following the competition, Schumacher* sets it own pace with the Fireblade USA Special Edition (SE). Unlike the other buggies in this feature, it doesn't have a molded-tub chassis in preference to a rigid, double-deck, fibercomposite chassis. From one end to the other, the Fireblade screams "unique" yet offers many race essentials like hard-coated shocks, slipper clutch and ball bearings. Rest assured, the Fireblade can stack up to the other racers, as proven by its recent placement as top qualifier for the

Worlds warm-up in Finland.

PERFORMANCE

All of the cars were set up with the kits' recommended setups; unfortunately, we found the Fireblade USA SE's setup isn't for most tracks. The kit's knobby front tires were a poor match for the blue-groove track of Long Island Raceway, but after we had mounted up a set of Pro-Line* ribbed fronts and Holeshot* rears, the car felt more sure-footed. We also found that the car jumped erratically when hitting a jump off camber. The stock shock recommendations gave it too much pack for the hard clay surface; the Fireblade would have benefited from a lighter oil. Overall, we found the Fireblade to be excellent, and with a little tuning and a change of tires, it performs just as well as its counterparts.

SUSPENSION

Up front, long arms are linked to a narrow bulkhead. The steering knuckle is attached to a small pivot block via a long threaded kingpin ball stud on the front arm. This unique system doesn't require a steering carrier. Adjustable turnbuckles grace the front and rear of the car. The long rear arms are captured inside by an aluminum pivot brace and a bolt-on adjustable pivot block. The pivot block has offset holes to change antisquat (3 or 1.5 degrees), and optional blocks are included to alter toe (3 or 0 degrees). The rear hub can be moved to change the car's wheelbase, but it has only one hole for the camber link. All adjustments have to be made on the shock tower,

which has multiple holes.

The Fireblade USA SE comes with aluminum, hard-coated shock bodies to replace the included composite damper bodies. Schumacher's Volume-Compensating Shock cartridges and Vari-shock pistons are provided. The pistons allow the number of holes to be changed without changing the actual piston. However, to do so, the shock has to be disassembled.

CHASSIS

Schumacher uses a double-deck chassis as a foundation for the Fireblade. The material may look like fiberglass, but it's S1 carbon composite—a rigid material that's strong enough to endure the rigors of off-road racing. Slots have been machined into the chassis to allow the batteries to sit as low as possible, and a composite battery brace secures the battery. Between the two decks surrounding the battery are composite-plastic cross-braces. When fully assembled, the Fireblade's compact chassis layout has minimal flex.

TRANSMISSION

The ball differential is factory assembled; we found ours to be ultra-smooth. Talking about smooth, Schumacher provides a full set of smooth ball bearings for the buggy. A slipper shaft and pad assembly is supplied with the SE kit. This is definitely a welcome unit to help the car through rough bumpy tracks, and it's added protection for the gears. A thick, purple-anodized motor plate is bolted to the unique transmission case. Blade universals are standard equipment. The unique plastic blade over the drive pin reduces wear on the outdrives and maintains smooth, consistent performance.



We thank the folks at Long Island Raceway, NY (one of the Northeast's premier off-road facilities), for letting us use their track during "off" hours to get wheel time with the cars. This facility will host the 1999 ROAR Stock Off-Road Nationals this summer.

To ensure parity in our evaluation of the cars on the track, we used Tekin battery chargers and Trinity discharge trays for battery management. This was in addition to all the other "playing-field-leveling" equipment used. Though all the cars were run using their factory-recommended setups, we thought we should at least give them all the same tires (as shown by the mountain of Pro-Line tires in the background).

Leveling the playing field

or the performance tests at Long Island Raceway, NY, we decided that we'd obtain more usable results if we at least powered all the buggies with the same motors and strapped on the same rubber.

Rick Hohwart of Peak Performance* was kind enough to provide three modified motors and three

stock motors. In addition, he hooked us up with batteries for each of the cars. All the equipment was painstakingly tested to ensure that we had matched equipment in all the cars. The modified motors were Peak

13x2 EBX Pros, and the stock motors were the Peak Illusion Blueprinted Stock rebuildables.

Pro-Line was nice enough to contribute a supply of tires that, according to local hotshot and ROAR Stock National Champion Vince Nocella, are the only tires to run at this track — the site of the

1999 ROAR Stock Off-Road Nationals.

The final step to get these cars powered as equally as possible was to juggle some spur and pinion gears to get the final drive ratio as close as possible on all three cars. The Losi car, with a 2.19:1 transmission ratio, was fitted with a 21-tooth pinion for a final drive ratio of 8.76:1. The Schumacher car has a transmission ratio of 2.00:1; this required a more drastic combination of a 21-tooth pinion and a 92-tooth spur. We had to stray from the stock spur gear on the Associated car as well, as we couldn't

get close enough to the magical 8.76:1 final drive ratio with the odd-numbered teeth available on the optional Associated spurs. We

ended up using an 84-tooth Robinson Racing* molded spur and a 23-tooth pinion. The ratios were kept the same for the stock motors. All pinions used during our tests were Robinson Racing, 48-pitch, hard nickel-plated-steel pinion gears.

HOW WE RATHED THEIRN

COMPLETENESS

Does the kit contain everything you need? Complete competition buggy kits should include full bearings, shock oil, non-standard tools, tires with foam inserts, etc.

INSTRUCTIONS

Clarity is everything; crisp illustrations, accurate parts legends and concise written instructions earn high marks.

EASE OF ASSEMBLY

In today's kits, extensive hand-fitting, scattershot parts and "impossible" assembly steps are no longer acceptable. A perfect "10" kit has logically bagged parts, goes together without a hitch and doesn't require the skills of a micro-surgeon.

MAINTENANCE

The key questions are: how often does it need maintenance, and how easy is it to maintain? Easy parts access and long-lasting settings score high.

PERFORMANCE

After spending considerable track time with each car, we came up with a number that sums up its turning and jumping prowess as well as its all-around agility.

VALUE

This one can be a little nebulous. Value often depends on perspective. You may be looking for the most "optioned" car. If the fully optioned car costs less than another that requires additional aftermarket purchases, the fully optioned car would be of greater value. On the other hand, if you simply want as much performance as possible for the least money, the best value for you may be a different car.

FEATURES	ASSOCIATED	LOSI	SCHUMACHER	
	RC10B3	XX 'CR' "KINWALD EDITION"	FIREBLADE USA SE	
Wheelbase range	10.25 - 10.375 in.(260 - 264mm)	10.54 - 10.66 in.(268 - 271mm)	10.19 - 10.313 in. (259 - 262mm)	
Width (F/R)	9.53/9 in.(242/229mm)	9.625/9.75 in.(244/248mm)	9.27/9.35 in.(235/237mm)	
Weight (RTR) 54.5 oz.(1,545g)		55.5 oz.(1,573g)	56 oz.(1,588g)	
Transmission ratio 2.4:1		2.19:1	2:1	
Chassis Molded-composite tub		Molded-graphite composite tub	Fiberglass/S1 composite double deck	
Slipper Single disk		Double disk	Single disk	
Drive shafts MIP Standard CVD		MIP Standard CVD	Steel universal	
Shocks	Hard-anodized, aluminum-body	Hard-anedized, aluminum-body	Hard-anodized, aluminum-body,	
	plastic cap, top-loaded seals	titanium-nitride shafts; bottom-loaded sealed cartridges	bottom-loaded, volume-compensating sealed cartridges w/variable piston	
No. of shock-mounting positions (I	F/R)			
—shock tower	3/3	3/4	3/3	
—suspension arm	2/2	3/2	1/3	
No. of camber-link mounting positi	ions (F/R)			
—outside	1/2	3/3	1/1	
—inside	2/2	3/10	3/6	
Battery-mounting position	Variable	Variable	2	
Ackerman positions	2	Variable	2	
Suspension-arm length (F/R)	2.9 in. (74mm)	3.06/2.93 in. (78/74mm)	3.07/3.2 in. (78/81mm)	
Available at	\$179	\$239	\$219	









COMMENTS

9998959 ASSOCIATED RC10B3

95 9 8 9 975 9 LOSI XX 'CR' KINWALD EDITION

The best all-around bang for the buck; includes all the essential components for maximum performance, yet it's the least expensive of the group.

The easiest to maintain (remove the tranny by unscrewing only four screws; externally adjustable diff; easy-to-build shocks), but the exotic materials of which it's built make it more difficult to assemble—primarily threading screws into harder graphite composite.

SCHUMACHER FIREBLADE USA Special Edition

888897

A highly capable machine that requires a little fine-tuning for maximum performance but can be tuned for just about any track. Our only real sticking point is price: it's a little expensive for the features included.

THE VERDICT

So is there an ultimate "best" here? That depends on you; from the statements that follow, choose the one that best sums up your R/C philosophy, and then see whether you agree with our pick.

"I WANT TOP-OF-THE-LINE **EVERYTHING.**"

It's a no-brainer: get the XX 'CR' Kinwald Edition. Nothing has been skimped on this car-nada. If Losi found a way to make titanium decals and there were even the slightest performance benefit to having them, they'd be in the box. The 'CR' KE is the handsdown most expensive buggy, and its assembly requires a more experienced hand because of the exotic materials used. But it's these exotic materials that make the KE the trickest buggy money

can buy. And compared with what you'd shell out for a standard kit plus hop-ups, the 'CR' KE is a steal.

"HEY, I WANNA RACE, BUT I **NEED TO KEEP SOME GREEN IN MY JEANS."**

Associated RC10B3 all the way. It includes everything that will make the most difference for the most drivers. The hair-splitting, not-critical-but-cool-to-have parts have been left out. You can always buy 'em as your budget allows; until then, you have money for entry fees. In fairness, Losi's standard XX 'CR' also does without the super-trick hardware that adds to the price tag. The standard 'CR' runs about \$10 more than the B3, so it has a similar bang/buck ratio, but the B3 still has a slight edge.

"I WANT A TRICK CAR, BUT NOT THE MOST EXPENSIVE; AND BY THE WAY, I GOTTA BE ME."

Schumacher Fireblade Special Edition. Yes, it's something different, but don't think of it as a gimmick-mobile. Schumacher's designers may have taken a different path, but they arrived at the same destination as Losi and Associated: like the B3 and the 'CR' KE, the Fireblade handles aggressively and will allow a driver with better skills to beat you routinely. Compared with the B3 and the XX 'CR' in standard trim, the Fireblade has the highest price tag, but the difference isn't significant enough to keep it off your "A" list when you shop for your next racing buggy.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

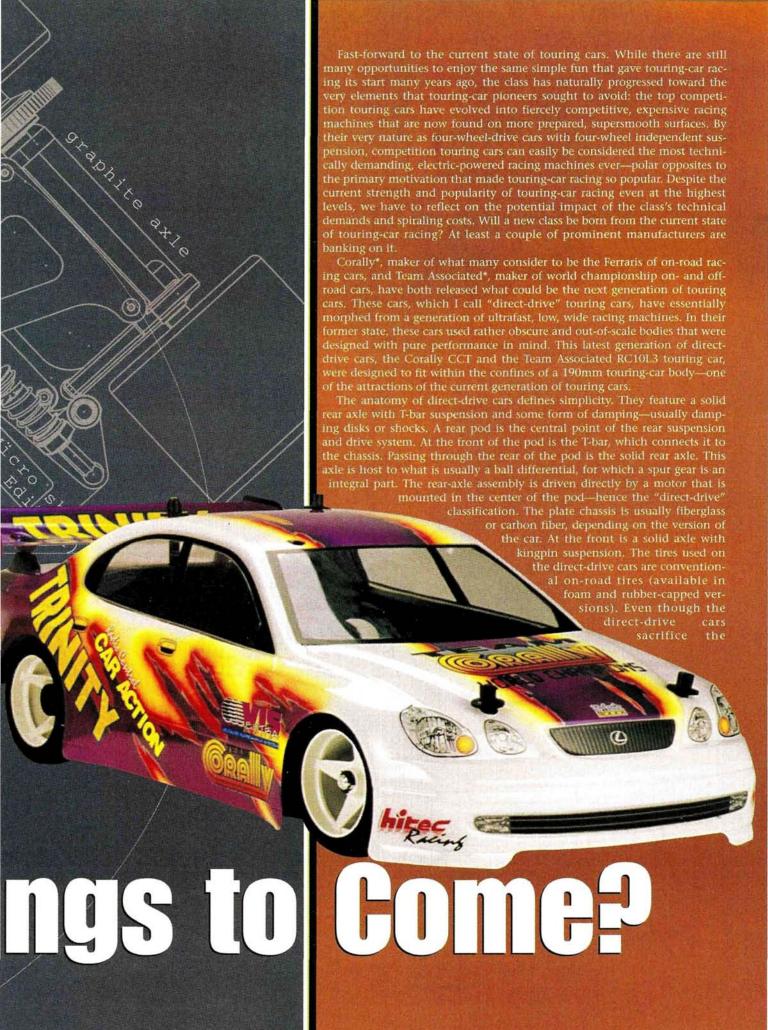
DIRECT-DRIVE TOURING CARS

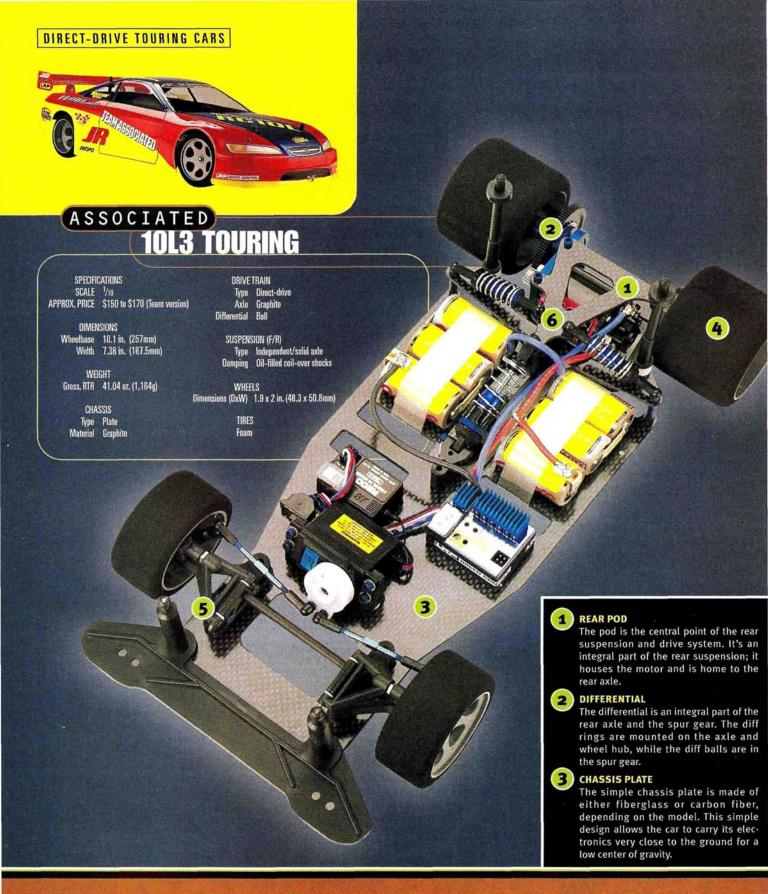
by Steve Pond

ouring-car racing had its humble beginning years ago when a group of racers simply wanted to escape the rigors of high-level competition by banging around a parking lot with some basic four-wheel-drive sedans. These were not sophisticated racing machines; in fact, by racing standards, they were rather simplistic and unrefined. They had a scale appearance and closely resembled the sedan that many of us knew as a "family sedan," albeit a pretty high-performance one. There was little in the way of the conventional race preparation and tuning that are common in other classes, and that was the attraction—raw, simple and fun.



The Shape of Ti



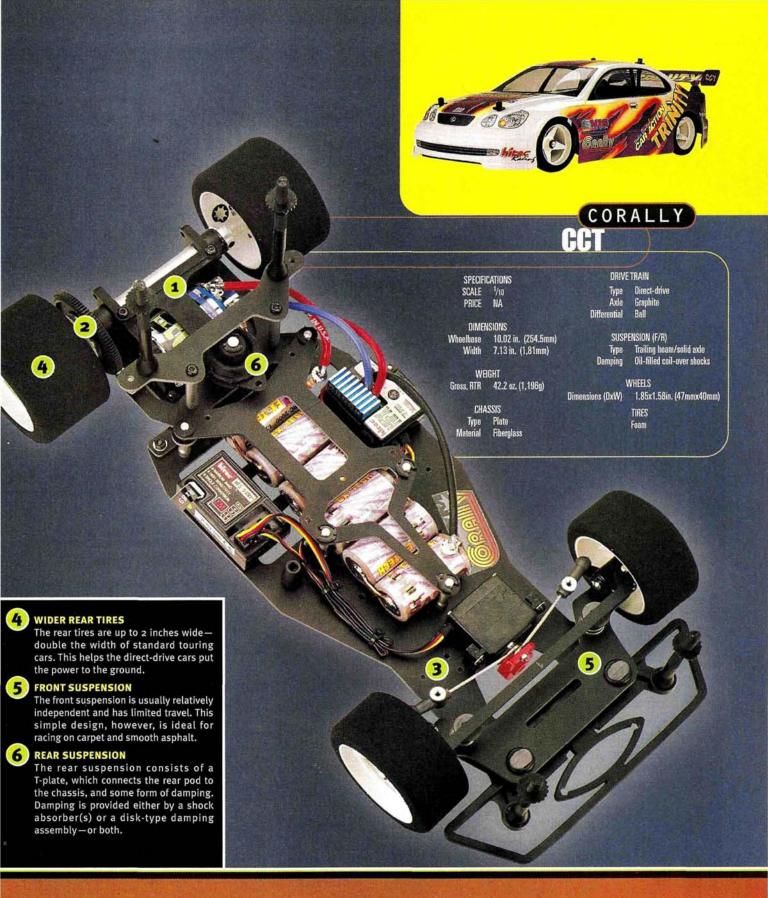


advantage of four-wheel drive, they have the advantage of rear tires that are as much as double the width of standard touringcar rubber.

The cost of running these new direct-drive cars is another big consideration that will contribute to their success. The top-of-the-line Associated car featured here (minus the nice-looking optional Factory Team blue stuff) will likely cost about half the price of the most expensive touring cars, and at the lower end of

the price spectrum, the basic "sport" versions should be available at or below the \$100 mark!

Despite their outward simplicity, these direct-drive cars are very competitive and light, they have a low center of gravity, and they suffer virtually no frictional loss through the drive system. Even though they are 2WD instead of the 4WD that is common in conventional touring cars, the direct-drive cars can usually outpace their 4WD cousins on the smooth carpet, asphalt and



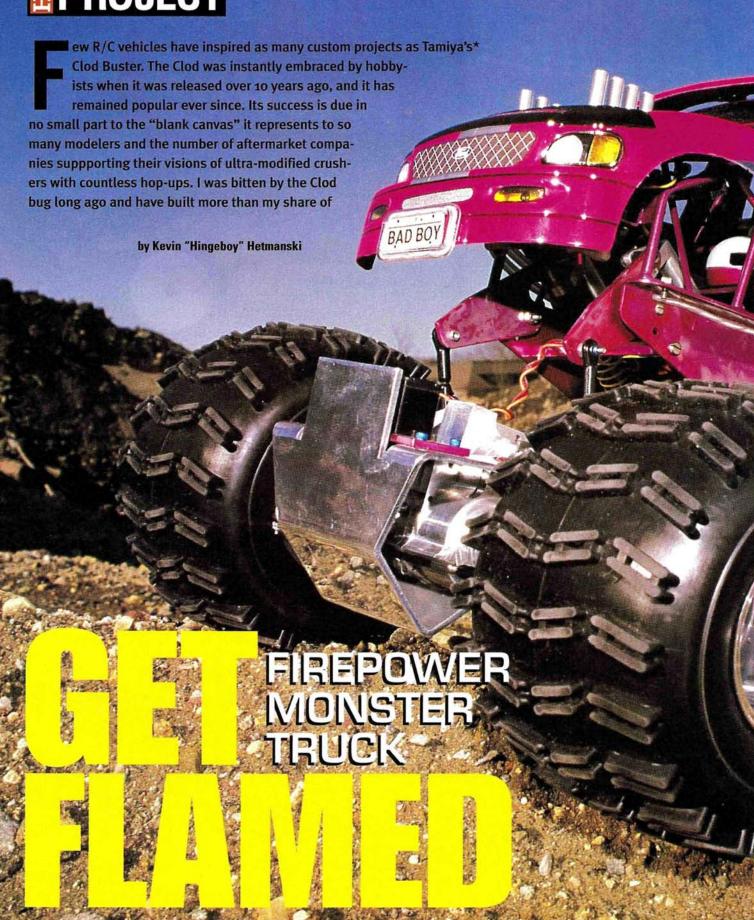
concrete racing surfaces that are becoming more common in touring-car racing.

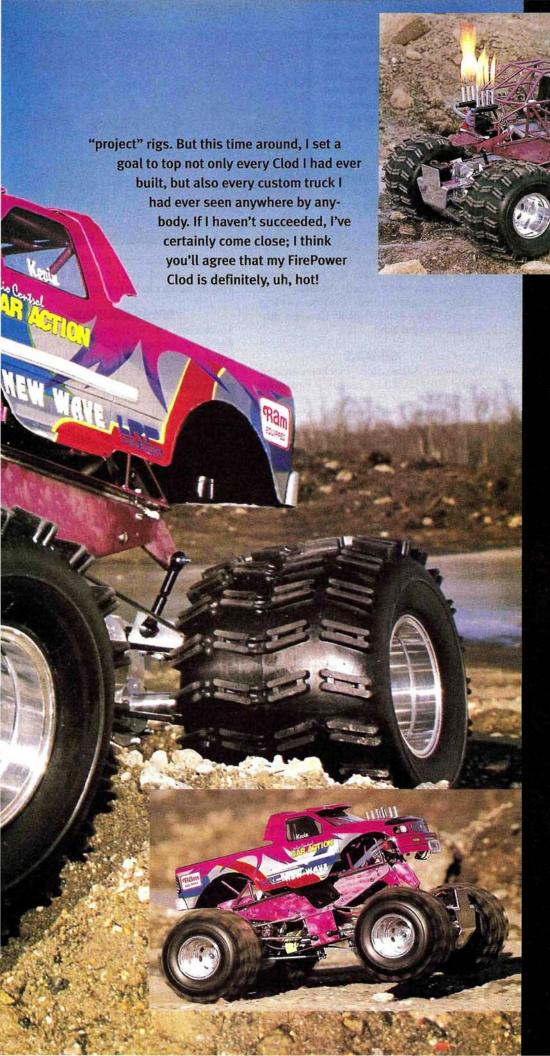
Will these cars replace the ubiquitous 4WD touring cars? I hardly think so. The 4WD cars have a tremendous following and will have a place in racing for at least the foreseeable future. In fact, both of the manufacturers who first released these direct-drive cars are developing 4WD mega machines to compete in the 4WD arena. The direct-drive car, however, will offer a lower-cost

alternative that is easier to tune and maintain at equal or higher levels of performance. The direct-drive cars are admittedly more limited when running on rough, bumpy surfaces. On the flat tracks that are becoming more and more typical of touring-car racing, however, the new cars should be excellent and inexpensive alternatives.

*Addresses are listed alphabetically in the Index of manufacturers on page 209.







In the words of Beavis,
"Fire, fire, FIRE!" An intricately
constructed system allows flame
to pump from the headers, with
flame height controlled via R/C.
[Editor's note: Hingeboy RULES!]

SPECIFICATIONS

SCALE 1/10
ESTIMATED

VALUE \$3,000

DIMENSIONS

Length overall 19 in. (483mm) Wheelbase 13 in. (330mm)

Width 15 in. (381mm)

WEIGHT

Gross, RTR 176 oz. (4,990g)

CHASSIS

Type Bennett Equipment Clod-A-Leaver II

Material Aluminum

SUSPENSION

Type 4-link

Damping Cantilevered progressive

shocks w/piggyback reservoirs

WHEELS

Type JPS Vette

TIRES

Type Pro-Line Giant Trac

ELECTRICS

Motors (2) Grand Motorsports

16-turn signal cobalt

Battery New Wave 7-cell 2000

ESC LRP Bullet

Radio Aitronics Caliber 3PS

Servo JRZ4750

Construction

time 14 months



Bennett's effective bash guard has a mercenary look in stock form; a mirror-like polished finish ups the glam factor considerably. The JPS wheels and tranny parts lend additional high-tech appeal.



The base of this monster is Bennett Equipment's* Clod-A-Leaver II chassis kit. You may remember it from our Mod Clod shootout in the May '98 issue. This kit has a huge, front "bash" plate that securely holds the steering servo and helps protect the front gear case.

The battery is mounted low in the frame, and that lowers the truck's center of gravity and helps prevent it from flipping over. Most people mount the batteries with zip-ties; although this is effective, changing packs is a hassle. To make battery removal easier, I used two Pure Tech* battery straps.

To add some flash, I sent all of the aluminum parts to 12-Pack Racing & Custom Anodizing*. They offer many custom anodizing colors and styleseverything from your basic purple to funky, multicolored anodizing and polished aluminum.

SUSPENSION

To give the ultimate in suspension travel, the kit utilizes a cantilever shock system. The setup is very similar to the suspension on real monster trucks. A smooth, four-link suspension system connects the gear cases to the chassis, and front and rear swaybars keep all four tires on the ground at all times. All of the stock links are made of durable stainless steel, but I replaced them with a prototype set of turnbuckle-type Lunsford* titanium links. These are light, stronger than steel and fully adjustable. This allows you to adjust the suspension without taking the suspension links off the chassis. The plate

where the battery is mounted also holds the lower suspension links. To help beef it up, monster-truckin' buddy Darren Grillo designed a simple, but effective, chassis

brace; it adds thickness to the rear of the lower plate and secures the front screws so they can't bend. I made the brace from a piece of aluminum that was lying around. Larry Bennett plans to add a similar piece to his line.

SHOCKS

Progressive Suspension* has been around since 1982 and has recently ventured into the R/C car industry. The company is well-known in the motorcycle industry for its high-quality motorcycle shocks. I chose these shocks for my project truck mainly because of their externally adjustable damping system; it's difficult to remove the shocks from the truck once they're installed, so the on-the-fly adjustability (just turn the spring perch) is a real plus. The piggyback reservoir caps are another goodie. They incorporate a volume-compensation system to absorb the oil displaced by the oversize shock shafts. Not only do they make the

Above: this ingenious

brace beefs up the lower suspension-link mount. for coming up with it, but my conscience forces me to credit Darren Grillo with the design (stupid conmy style!) Left: the trick reservoir shocks from Progressive were too cool to pass up. Their externally adjustable damping makes it easy and the reservoirs serve as volume-compensation



suspension smoother, but they also look fantastic. I used Trinity* shock mounts to attach the shocks to the cantilevers.

SPEED CONTROL

To control the voltage, I chose LRP's* Bullet reversing speed control. LRP is known for its championship-winning speed controls, and the Bullet was the perfect choice for this truck. The instructions specify that the fewest number of turns that you can use is nine. To run dual motors, the instructions suggest that you add two turns to the fewest number of turns listed. This means that I can use any motor from 11 turns upward.

MOTORS

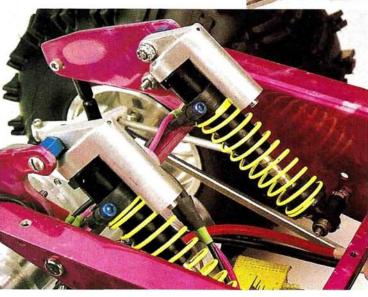
I wanted the FirePower Clod to have ridiculous horsepower, so I called Grand Motorsports'* Roy Anderson, who is wellknown in R/C drag racing for making killer cobalt drag motors and racing chassis. The company has never made motors

for this type of application, but Roy assured me that if we worked together, he'd be able to come up with motors that would rip the tires off the rims. We tried a pair of 11-turn, single cobalt motors; these gave the truck warp speed but they didn't have the low-end torque that I was looking for. We eventually settled on 16-turn single cobalt motors with torque rings and heavy springs.

ROLL CAGE

With a little cutting, bending, soldering and time, I was able to construct a sweet roll cage, and that gave me a place to securely mount anything that could not be mounted on the chassis. The roll cage works just like a real one; the soldered brass tube can withstand a rollover and protect the chassis and the shocks. Best of all, it looks great.

Of course, I couldn't have a realistic roll cage without an interior. The seat is from a Parma* smallblock Chevy kit. I wanted gauges that looked like the ones in the real monsters, so I made my own with sections of dowel. I glued a thin





IPS Goodies

PS aluminum gear cases are arguably the most lusted after Clod hop-ups available. They are machined from a solid piece of aluminum stock and look like

baby! That's my Austin Powers impersonation, in case you were wondering. You can't help but get excited about JPS's beautiful gear cases, axle tubes and hubs. The custom titanium links are from Lunsford.

pieces of art-really trick stuff. The latest JPS gear cases are great improvements on the previous design. When the old gear cases were assembled, the gears did not

move freely; this was done to make the gear mesh tighter to increase durability, but the tighter mesh slowed the truck and was tough on motors. JPS changed the tolerances, and now the gears spin smoothly.

Another big improvement is found at the end of the axle tubes: ball bearings for the steering pivots instead of bushings. Before buttoning up



Nothing looks more like a real aluminum wheel than a real aluminum wheel! Bomb-proof and flawless from JPS.

the gear cases, I replaced the stock Clod bushings with Boca Bearing* Ultra Seal bearings; they are strong, sealed against the elements and ultra smooth.

I find that four-wheel steering is overkill and makes handling twitchy, so I machined a piece of aluminum to fit where the stock rear steering pieces go. I connected a link from the outer hubs to the machined lockout piece. To complete the package, I installed a set of JPS aluminum Corvettestyle wheels. I think these classy-looking rims tastefully complete the truck.

piece of aluminum tube to the outside of the dowel to create the gauge's rim. The gauge faces are from J'Tec*, which offers stick-on faces in various sizes for detailing R/C boats and airplanes.

The steering wheel is from an old Tamiya Bruiser kit, and the floor, gas and brake pedals are made of polystyrene. I even made a shifter from a few pieces of styrene and brass. The helmet on the seat is from a Kyosho sedan kit. It originally had a driver's face molded in; after a little grinding and sanding, I had an empty helmet. The seatbelts are rubber bands colored black with a permanent marker.

top off this beast. I passed the body over

BODY I chose Parma's* Ford Bigfoot body to

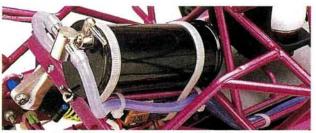
The tube-frame roll cage is constructed of brass tubing. The seat is a spare part from Parma's hemi engine kit, and the helmet began life as a Kyosho driver's head.

to R/C Car Action Assistant Editor Greg Vogel for a trick paint job. He used Parma's new Faskolor paints sprayed through a Testor's* Model Master airbrush. I had plans for this body that extended beyond mere paint however. Since I wanted the truck to look as good at night as it does during the day, I decided to

add lights. I used RAm* headlights with aluminum reflectors up front, and RAm's taillights and stoplights with red lenses for the rear. These lights work just like the lights on a real car: apply the brakes and the tail lamps glow brighter. For the turn signals and driving lights, I used

> RAm clearance lights mounted in custom-built housings.

When I visited the R/C Car Action office, Greg showed me a Dodge Ram body with neon lighting. I just had to have this cool neon for my project truck, so I blew off getting groceries and bought a neon license-plate-frame kit, a body-lighting kit and 3D neon cable. I installed the neon cable under the lip of the chassis to light up the suspension and gear cases.



This scratch-built tank holds the fuel for the flame system. And that's all I'm telling you!

OTHER STUFF

To guide this powerful monster I chose my Airtronics* Caliber 3PS. I was happy to have an opportunity to exploit the Caliber's 3channel capability; the third channel controls the height of the header flames. The steering is kept under control with a JR* Z4750 high-torque servo. A 7-cell pack from New Wave Cells* sits in the bottom of the frame. Trinity blue-anodized screws and 4-40 nuts, OFNA* anodized cone washers and Tamiya blue-anodized wheel nuts add a little more color to the truck. Whew!

PERFORMANCE

You can't build a truck like this and not drive it. As heavy as this truck is with all the accessories I added, it still moved out really well. The Pro-Line* tires ripped through everything they met. A romp through the woods was the ultimate test. I drove the FirePower over rocks, logs, leaves, bushes and small animals (just kidding about the animal thing). Nothing could stop it!

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

Traxxas Nitro 4 TEC Pro goes to production

raxxas has just released the eagerly anticipated Pro version of its popular-and fast-Nitro 4 TEC touring car; the kits should be on the hobby shop shelves by the time you read this. As you probably know, the car features a weight-optimized layout and a blue-anodized, countersunk racing chassis, full bearings, a 2-speed tranny, Pro-Line V-Rage tires, front and rear sealed ball diffs, hard-anodized and Tefloncoated touring shocks, a foam front bumper, front and rear swaybars and graphite everything.

Now here's what you probably didn't know: the car will be sold in kit form only and will not come with an engine or tuned pipe. The designers at Traxxas feel that most racers prefer to choose their own engine and tuned pipe, so they left them out, lowering the cost of the kit. Traxxas has announced that the Pro kits will include a full set of Lunsford titanium tie rods and a header designed to work with pull-start and non-pull-start engines.

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HPI to join ¹/8 on-road ranks!

factory driver, Richard Saxton

S erpent, BMT, Picco and the rest of the ½-scale on-road racing industry will meet a new challenge from HPI this year as the popular manufacturer readies its own ½-scale on-road platform. Expect HPI to exploit its connection with NovaRossi by developing a .21 engine for the new machine. More details to come as our industry moles bribe and cajole their sources!

Aluminum pulleys for HPI and Traxxas nitro tourers from Robinson Racing. That's racing!

Robinson announced plans to produce precision machined-aluminum pulleys for the Nitro RS4 series and Traxxas' popular Nitro 4-TEC. Cut from super-hard 7075 aluminum for superior wear characteristics, the Robinson Racing pulleys will be available with a natural finish or anodized in purple (for HPI) or blue (Traxxas).

New budget touring car from Yokomo

Vokomo recently announced that a sport-level touring car will soon be added to its existing line of high-performance on- and off-road R/C vehicles. Unofficially named the MR4 Sport, the vehicle will feature a molded chassis that's similar to the company's MR4 rally car chassis, minus the completely sealed drive train. The MR4 will have a dual belt-drive system and will include a body, but to keep it affordable, it will probably have bushings instead of bearings and dogbones instead of universals. The MR4 may also include other goodies, but the exact details were not available at press time. We'll pass along more information as soon as it's available, but we've heard that the prototypes handle very well and are quite competitive. To be certain, a sport-level tourer can only increase the popularity of the Ycars among entry-level racers.

Team Losi announces "Certified" shock fluid line

Team Losi will soon release a new line of silicone shock fluids to replace the Silatech line. The "Certified" shock fluids are the result of efforts to improve the consistency of shock fluid batches. According to Losi's Jack Johnson, it's not auncommon for two batches of shock fluid labeled as being of the same weight to actually have different viscosities. To

guarantee all Losi Certified shock oils are the same viscosity from batch to batch, Team Losi has invested in cutting-edge viscometers to measure the viscosity of each batch before the fluid is bottled. This means that a bottle of 50WT Certified shock fluid purchased today will have the same viscosity as a bottle of 50WT purchased a year from now. Certified shock fluids will be available in 5WT increments from 5WT to 50WT and in 10WT increments from 50WT to 100WT. You can also expect to see the new fluids offered in multi-packs of five or six bottles with viscosities tailored to on-road and off-road racing.

RACER TIP OF THE MONTH

Richard Kouche Team HPI driver

The HPI Super Nitro RS4 was designed to be as rugged as possible: chromoly outdrives in the diffs and hardened-steel dogbones ensure the utmost strength. For some reason, when the two materials mate, there's

a squeaking that was a mystery to us at first. We found that applying grease to the dogbones' drive pins permanently eliminated the squeaking. If your Nitro RS4 has a case of the squeaks, give this tip a try.





RACER-news

Mike

itec RCD has earned a reputation for providing high-quality radios, servos and chargers at economical prices. The company has now taken a different direction and is pursuing the high end of the racing market with a new computer radio - a dual-conversion FM receiver and a brand-new line of highperformance coreless servos.

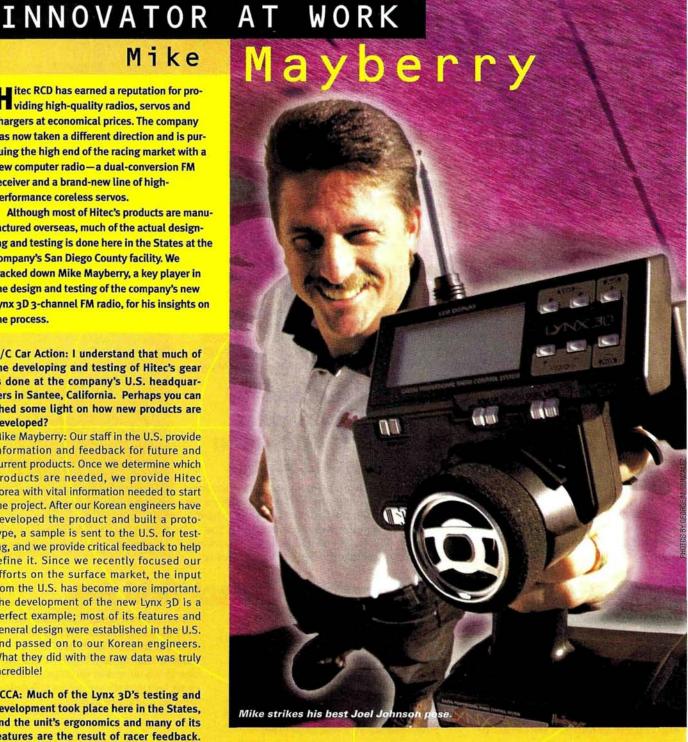
Although most of Hitec's products are manufactured overseas, much of the actual designing and testing is done here in the States at the company's San Diego County facility. We tracked down Mike Mayberry, a key player in the design and testing of the company's new Lynx 3D 3-channel FM radio, for his insights on the process.

R/C Car Action: I understand that much of the developing and testing of Hitec's gear is done at the company's U.S. headquarters in Santee, California. Perhaps you can shed some light on how new products are developed?

Mike Mayberry: Our staff in the U.S. provide information and feedback for future and current products. Once we determine which products are needed, we provide Hitec Korea with vital information needed to start the project. After our Korean engineers have developed the product and built a prototype, a sample is sent to the U.S. for testing, and we provide critical feedback to help refine it. Since we recently focused our efforts on the surface market, the input from the U.S. has become more important. The development of the new Lynx 3D is a perfect example; most of its features and general design were established in the U.S. and passed on to our Korean engineers. What they did with the raw data was truly incredible!

RCCA: Much of the Lynx 3D's testing and development took place here in the States, and the unit's ergonomics and many of its features are the result of racer feedback. Which changes were made as a direct result of racer input?

MM: Most of the original input, testing and feedback was done here, but the Lynx 3D was developed in Korea. I have to give credit to our engineers over there; we gave them a concept and they came up with the design.



Once I received the prototype, I let several key people try it and utilized their feedback to make a few key changes, most of which related to the "feel" of the radio. The trigger size and neutral point were redesigned, and the travel of the steering wheel and spring mechanism was modified for increased travel and a more balanced spring rate. The radio was very close to perfect from the start, but these small changes really enhanced the 3D's overall "feel." I honestly believe it has the best balance of any radio on the market today.



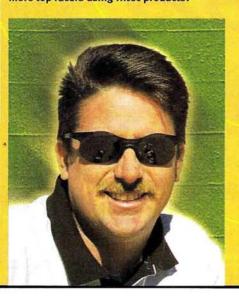


RCCA: At national events, I've seen you race R/C cars and boats and finish very well. As a racer and a hobbyist, what's your evaluation of the new radio? If you could have had it entirely your way, would any other features have been incorporated in its design?

MM: Using 100 percent Hitec equipment, I have had some very respectable finishes in the past couple of years, including third place in Stock Sedan at 1998's ROAR Nationals in Houston. Since I am an accomplished racer with 20 years of experience, I felt I had a good understand-

ing of what was needed to build a top-level system. The only feature I suggested that was not implemented was a lap counter. One of my primary concerns was to incorporate versatile features that people could actually use to improve their cars' handling-not fancy functions nobody knows how to use! The Lynx 3D is a true competition-grade radio that compares very favorably with any other toplevel radio. Its unique Auto Dual Rate allows the user to individually select adjustable-rate settings for high- and low-speed steering. Features like this make the 3D much more versatile, and with its easy-to-read LCD display and straightforward programming, there is no need to take the manual to the track with you!

RCCA: Hitec sponsors racers; will you continue to scout for new talent, and will we see more top racers using Hitec products?





Mike is an accomplished R/C pilot with over 20 years of experience. He is shown here with a few of his toys, which include planes, boats, helis and, of course, cars.

MM: Hitec established the "Factory Pilot" program in '96 and has sponsored several car, boat and aircraft racers with excellent results, including multiple state and national championships. We are constantly adding new racers and are always accepting résumés. One of the reasons Hitec didn't appeal to top-level racers in the past was we didn't offer a computerized, pistol-grip system. Since that has changed, Hitec's Factory Pilot program has been restructured to entice big-name drivers to race for us and also to allow less prominent drivers to benefit from the program. We feel confident the Lynx 3D will make several A-main appearances at a number of major events in '99.

RCCA: In the past, compatibility has been an issue: because many R/C car manufacturers do not provide servo horns or servo-savers that fit Hitec servos. Space might be another issue: some of Hitec's high-speed/high-torque servos are larger than comparable units. Will we also have these problems with Hitec's soon-to-be-released line of coreless servos?

MM: Yes, unfortunately, many R/C car manufacturers did not see Hitec servos as a choice for their vehicles. Thankfully, that has changed; companies such as Associated, Team Losi and HPI now include Hiteccompatible servo horns in their kits. I don't think it will be long before all manufacturers include a compatible horn; if they don't, they'll be doing their customers a great disservice. If there isn't a Hitec-compatible horn with a particular kit, the consumer can still use the heavy-duty horn included with all of our servos. We are very excited about the new coreless servos; they are of a standard

size that's similar to the popular HS525 and will fit most vehicles without modification. It will be available in high-speed and high-torque versions and will incorporate all-metal gears, including an aluminum output and secondary gear—unlike other coreless servos that use a nylon secondary gear. As always, for comparable performance, expect to pay 20 to 30 percent less for our products than for our competition's.

RCCA: The last time I visited Hitec, you showed me blueprints of the new U.S. facility and said you'd soon be breaking ground.

When will I get my invitation to the ribboncutting ceremony?

MM: Yes, we do have a new 14,500-squarefoot facility in the works in Poway, about 15
miles north of our current location; we should
move there in mid-June. Make sure you keep
August 14 open on your calendar because
that's the date set for the first annual Hitec
Racing parking-lot extravaganzal It will be
held with Hobby Shack's parking-lot series at
our new facility.

RCCA: So what does the future hold for Hitec? Are you working on any new products or ideas that you can share with our readers? MM: Hitec is always looking to the future, and 1999 will be a big year with the release of the Lynx 3D, DCX receiver and coreless servos. These products were a long time coming and should be well received by racers. In late '99, Hitec will produce a new pistol-grip radio called the "Lynx Sport." It will have a totally new case design and will be very reasonably priced. We are also developing an ultra-micro 4-channel FM receiver targeted at the aircraft market, but there will also be a 75MHz version for cars and boats. This new receiver will weigh only 8 grams! Finally, a long-awaited, 10-model-memory, 8-channel, super aircraft radio with all the bells and whistles is planned for late '99. We have our sights set on the top and aren't going to slow down until we get there.

RCCA: Thanks for the interview, Mike, and good luck with your endeavors.



RAGER news

Speci Stop

New tuning parts from Yokomo

Yokomo's* Setting Spacer kit is designed to make spring preload adjustment more precise. The kit includes eight 0.3mm and eight



0.5mm spacers—much thinner than the stock spacers that are included with most kits. Although most touring car kits come with



preload spacers in various thicknesses, the thinnest is usually about 1 mm, which can be too thick in some cases. Yokomo's spacers allow much finer preload adjustment, and that means you'll be able to set you car's ride height and tweak more precisely. The Yokomo Setting Spacers are color-coded for easy identification: blue— 0.3mm thick; brown—0.5mm thick. Although intended for the company's YR4 series touring cars, the setting spacers will work on most touring car shocks that feature clip-on preload spacers.

Yokomo's Pro Series Racing Springs

These are just what you need to get your Yokomo YR4 M2 Pro (or just about any other touring car with shocks of a similar size) dialed on any track. The springs are sold in pairs and are available in five rates The Black springs (40.0 rate) are as stiff as valve springs, and the Blue springs (20.0 rate) are the company's softest, but still pretty firm. For more information, call your hobby dealer or Yokomo USA—(510) 284-5778.

Part nos. and prices

Setting Spacers-ZC-732S, \$3.50.

Pro Series Racing Springs—YS-2-BLU (20.0 rate), YS-2-WHT (25.0 rate), YS-2-YEL (30.0 rate), YS-2-GRN (35.0 rate), YS-2-BLK (40.0 rate), \$4/pair.

PURE EXCITEMENT VECTOR Spec 99



Serpent USA, Inc. West Park Center 2832 NW 79th Ave. Miami, Florida 33122 Tel: (305) 639 9665 Fax: (305) 639 9658 E-mail: serp-usa@ix.netcom.com



Acer Racing Precision Carbide and HCCA Diff Balls and Power Pole Connectors

Acer Racing* manufactures super high-quality diff and thrust balls in sizes to fit most R/C cars. They're available in carbide steel and high-carbon chrome alloy (HCCA), and Acer claims the diff balls in each package are matched for concentricity and must pass strict quality-control checks; in short, the balls are extremely hard and smooth.

Acer's HCCA diff balls are an economical alternative to carbide yet are superior to the standard stainless-steel balls that come with

many kits; they're harder, smoother and more durable and available in sizes to fit most kits. The chart shows prices, part numbers and applications.

Acer also distributes the popular Power Pole connectors that accept wire in sizes up to 12AWG. The connector has also been redesigned to make soldering much easier, and it's silver plated, which, according to Acer, is at least 39 percent less electrically resistant than comparable gold-plated connectors. Thanks to their patented spring-loaded design, they're also self-cleaning. Power Pole connectors are UL recognized, and the design has been tested to 10,000 cycles without showing signs of degradation. Power Pole connectors are also compatible with LightSpeed, DuraTrax and Sermos connectors.





Carbide Diff Balls

- Losi, HPI, Yokomo, Associated (offroad) and Traxxas—³/₃₂ in. and 2.4mm, \$6.50 for 12.
- Bolink, Trinity, Kawada, OFNA, Xpress, Tech Racing, Associated (on-road)— 1/8 in., \$6.50 for 12.
- Tamiya and Schumacher (gas)—3mm, \$8 for 10.
- · Schumacher (electric)-4mm, \$8 for 10.

Carbide Thrust Balls

- Losi and Yokomo—¹/16 in., \$8 for 16.
- Associated, HPI and Tech Racing—
 5/64 in. and 2mm, \$8 for 16.

HCCA Diff Balls

- 3/32 in., 1/8 in. and 2.4mm, \$3 for 24.
- · 3mm and 4mm, \$4 for 30.

HCCA Thrust Balls

½16 in., ½64 in. and 2mm, \$3 for 32.

Acer Power Pole Connectors

· CON2PR, \$3/pack of two.

PURE EXSITEMENT www.serpent.com

Our totally new Team Serpent Network website is a lot like our Vector Spec 99 – fast, powerful, and loaded. Set-up a <u>customized home page</u> that presents the info *you* want (even the <u>language</u> you want it in, comprende?). See which friends are on-line and jump into a <u>chat</u> to discuss important topics like fuel consumption, tires and which race has the best track food. <u>Ask the Pros</u> technical questions, and the <u>racer forums</u> let everyone rant and rave.

Thinking of buying a Serpent? Check out the <u>Vector Spec 99</u> features that propel it from 0-60 in 1.5 seconds and send it down the straight at over 70. Read how it swept the Worlds in one of many <u>race reports</u>. When you're ready to join the fun, you can even sell your old car in our marketplace and find a <u>Serpent shop</u> near you. Don't mention it ;-).

www.serpent.com - The coolest cars. The hottest site. Gentlemen, start your modems.



OBR-

Richard Saxton

Team Associated/Thunder Tiger/Orion factory driver Richard Saxton is well known as a competitive R/C off-road racer, but he has a past in professional motocross as well. According to Richard, the two sports are closely related, and many professional motocrossers enjoy racing R/C cars and trucks because of their similarities. Richard recently signed on with Team Orion, HPI and Thunder Tiger, so there's no doubt that we will be seeing his name on the winners' charts at all the major races.

SIGNS

Age: 26

Occupation: property manager and R/C racer

Hometown: Las Vegas, NV

Years racing: 7

First R/C car: Team Losi truck

Favorite racing class: 1/8-scale gas off-road

Favorite track: Detroit, MI

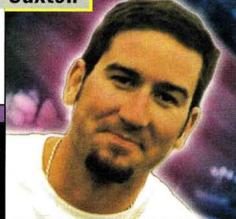
Favorite race: '96 TRK World Cup

Sponsors: Associated, Thunder Tiger, Orion,

HPI, Pro-Line, Robinson Racing, JR

Propo, Paris, MIP, Lunsford, HG,

Blue Thunder, Dynamite, Arnette



R/C Car Action: How did you get hooked up with R/C racing?

Richard Saxton: My friend Tony Berluti, who is a factory mechanic for Suzuki, bought a Team Losi buggy and converted it into a truck. We built a track in his backyard, so I had to buy a truck so I'd be able to thrash with him on the track.

RCCA: Do you race motorcycles professionally, or is it more of an extreme hobby for you?

RS: I've raced motorcycles for 15 years - two of those years as a pro. I actually met Cliff Lett when I was around 8 or 9 years old and I raced for Yamaha. When I was 6, I was given my first full factory ride by a company called Italjet, and I won numerous championships for them. I don't race professionally anymore, but I do race frequently for fun and exercise. I love the sport and can't wait for the first stadium race in Anaheim, California; it will be awesome.

RCCA: Do you feel that your experience with motocross benefits your R/C driving ability, or are the two skills completely unrelated? RS: The two sports go hand in hand. Timing, picking a fast line and mental focus are pretty much the same, and the way a dirt bike acts is like how an off-road R/C car acts when it's raced. The way the two differ is that on a bike, you can case a triple jump and laugh about it later, but an R/C car needs help coping with mondo air time.

RCCA: You recently joined Team Orion and use their batteries and motors in your electric cars; you've also teamed up with Thunder Tiger and plan to race their new EB4-03 1/8-scale gas buggy. What were some of the events that led you to decide to join forces with these companies?

RS: Thunder Tiger approached me with an offer to lead their off-road team and help with future R&D, which interested me greatly. I wouldn't mind winning a championship with this brand-new vehicle, and I'm sure Thunder Tiger would like it, too. The fact remains, however, that the new EB4-03 is a true racing vehicle, and any fast driver will be able to win with it; I just want to be the first!

Team Orion approached me to head up their mod truck division. HPI is making nitro engines, and I will be racing their .12- and .21size engines. Of course, I'll be using Team Orion's electric motors and batteries in my electric trucks, and I hope they'll give me a competitive edge.

RCCA: Playing poker in the hotel lobby during the '95 IFMAR Off-Road Worlds in Japan, I remember that you hustled quite a bit of money from me and a few other racers. I later found out that you live in Las Vegas, and that added insult to injury; does your zip code indicate that you're a professional gambler, or am I just a sucker?

RS: No. Actually, I'm the sucker, but apparently, you're an even bigger sucker-just busting on you, G-Man! In fact, every time Team Associated factory driver Mark Pavidis comes by to visit me, we head off to the Las Vegas strip and I lose my shirt every single time. You have to remember that winners did not build Las Vegas; losers like you and me built it, my friend.

RCCA: Who do you consider to be your toughest competitors, and do you like to compete against or enjoy traveling to races with any particular racers?

RS: There are just too many fast guys who could win on any given day for me to mention. As for traveling, I could travel to Siberia and still have a blast with the squirrels I hang out with.

RCCA: Is Scott Hughes the squirrel you're referring to, or is there more than one squirrel?

RS: There are plenty of squirrels out there that I consider friends, but Scott Hughes is the uncontested king of the squirrels.

RCCA: You're obviously an off-road enthusiast, but will we ever see you piloting an on-road car or a touring car? How about carpet racing; does that appeal to you?

RS: As far as racing on-road goes Sorry; I only play in the dirt.

RCCA: What do you enjoy when you aren't racing? Are you involved in any other hobbies or in athletics?

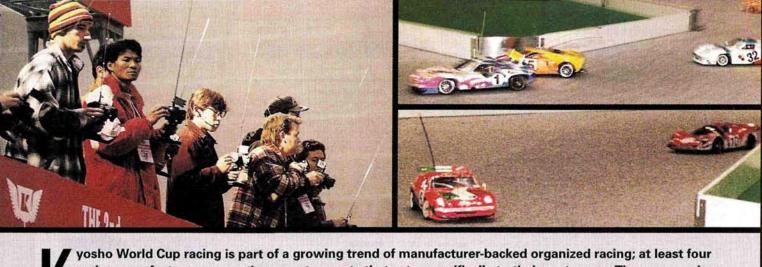
RS: I love my TV. I also enjoy going to my brother's cabin to go snowboarding. I think you have me pretty much summed up, and that's really sad.

RCCA: What does the future hold for Richard Saxton? Are you chasing any goals that you can tell us about?

RS: Going to the '99 IFMAR Worlds in Finland would be really sweet. Winning the 2000 IFMAR 1/8-Scale Gas Off-Road Worlds in Las Vegas would be a dream come true. Being the first American to win this title would go off well, too. I plan to keep racing and have fun in the process; after all, that's what R/C racing is all about.

RCCA: Thanks for your time, Richard. I wish you all the best in your racing endeavors. And remember that you have to give me a chance to win some of my money back. Maybe we should have a rematch at the Worlds in Finland.

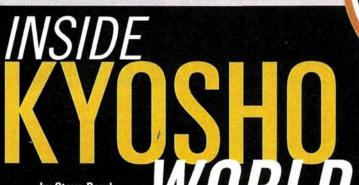




yosho World Cup racing is part of a growing trend of manufacturer-backed organized racing; at least four major manufacturers currently promote events that cater specifically to their customers. These races give car owners the opportunity to compete against similar cars in a relatively controlled environment. The emphasis is usually on keeping the cars competitive, so driving skill and vehicle preparation are rewarded. Now entering its fourth year, the Kyosho World Cup is a worldwide racing series with very specific rules that keep all the cars on an equal footing. The nitro-powered Kyosho* GP Spider 4WD and the newer, more refined GP Spider MKII are the vehicles of choice for World Cup racing.

World Cup racing starts at the local level with programs offered by Kyosho to provide assistance to help hobby shops get the racing off the ground. To minimize the cost of racing, the rules are

the most restrictive at the local level. The next step up are the regional races (see 1999 Race Schedule), which allow more in the way of modifications to increase the level of performance but still require use of the standard Kyosho GS-11R or GS-11X pull-start engines. Even though the cars can handle higher speeds, the engines are identical, and that keeps the racing as competitive as it can be. At the conclusion of the four regional races, the winning team from each region is invited to the World Cup finals to compete against other racers from around the world; all expenses are paid by Kyosho!



by Steve Pond





Build your own World Cup winner

Kyosho World Cup rules permit certain modifications to improve the car's performance. While the mods are limited to Kyosho parts, there is quite a long list to choose from. The rules allow these optional parts primarily to prevent a current owner of a Spider who may already have installed them from being excluded from competition. But as long as mods are

allowed, it makes sense to take a look at what can be used in addition to what you already have on your car.

Some Kyosho options are performance enhancers, and others are "intimidation factors." Regardless of your intentions, take a look and see what is possible within the rules of World Cup.

SPECIAL LOWER CHASSIS

The optional lower chassis plate is 2.5mm thick—.5mm thicker than the stock chassis. This allows use of the included countersunk screws and provides a more rigid backbone.

CARBON-FIBER UPPER PLATE

One of those frivolous "intimidation" parts. The stock upper plate is more than adequate, but the slightly lighter, good-looking carbon-fiber plate is too good to pass up.

2-SPEED TRANSMISSION

The length of the track plays a big role in determining the need for a 2-speed trans-

2-speed transmission. It's certainly a benefit on longer tracks but may be a liability on shorter ones.

BALL DIFFERENTIALS

There is nothing like the smooth operation of ball diffs. Installing them will noticeably improve handling, but they are on the pricey side. An excellent alternative is to install the machined-steel diff gears. They operate much more smoothly than the stock gears and are more durable.

TEFLON TOURING SHOCKS

These aluminum-body shocks are a sharp upgrade that provides the ultimate in smooth damping. They are set up with 70WT silicone shock oil on all corners, heavy springs on the rear shocks and one step lighter springs in the front. Note that the rear shock-mounting position has been changed from the middle hole of the suspension arm to the swaybar mount of the hub carrier. This makes the chassis run flatter through the corners.

SERVO-SAVER REINFORCING SPRING

Designed for use with basic servos. If you plan to use a competition servo, the stiff reinforcing spring will improve steering response.

TUNED-PIPE SET

A header and tuned pipe are the best options, and they're the ones that will increase the engine's power output. An optional coupler to attach the header and pipe is also required.

VESPAL CLUTCH SHOES

Direct replacements for the stock clutch shoes, they have more grabbing power and wear better than the stock equipment.

FUEL FILTER

This one is a no-brainer — nuff said!

STEEL DISK BRAKE

The stock plastic brake provides plenty of braking power, but when competing in an hour-long event, the metal disk brake provides an extra level of security. If it is abused or out of adjustment, the plastic brake may begin to melt.

SIDE-BELT TENSIONER

This prevents the side belt, which runs on two small pulleys, from skipping under heavy loads.

HARDENED PULLEYS

These pulleys also provide an extra level of security in long races. Their hardened-aluminum construction virtually guarantees that they will not wear out anytime soon. If nothing else, get the hardened counter pulley that is installed where the brake disk is mounted. This pulley takes the most punishment.

HIGH-PERFORMANCE RADIO GEAR

The rules don't limit the type of radio gear that can be installed in the Spider. This car takes advantage of a Futaba* 3PDF radio with Futaba 9402 servos. A 5-cell Orion* Ni-Cd receiver battery pack offers ultra-quick response.

TITANIUM TURNBUCKLES

These replace the stock, non-adjustable camber links and steering tie rods and require the purchase of ball ends for installation.

UNIVERSAL-JOINT DRIVE SHAFTS

Available to replace the stock dogbones. They operate with greater efficiency and are lighter than the stock hardware.

SUPER-NARROW WHEELS AND SOFT-COMPOUND RACING SLICKS

The stock wheels and tires are good enough for cruising, but a good set of wheels and racing slicks will make the Spider stick to the ground much better.

"HARD" SUSPENSION ARMS

These replace the softer, more flexible stock ones and eliminate much of the unwanted flexing that can cause erratic handling.

KYOSHO WORLD CUP RACING



Left: the front end of the GP Spider benefits tremendously from the hard-composite suspension arms. They minimize flexing, which keeps the front tires planted. Note the universal-ioint drive shafts. ball differential and the Teflon touring shocks (SS). Carbon-fiber shock towers are also available, but I found the stock plasticcomposite units very strong.

Right: a steel brake disk, a hardened pulley and a center belt tensioner help toughen up the GP Spider for a potential 1-hour A-main. A 2-speed transmission is available for longer tracks. Note the titanium turnbuckles for quick suspension adjustment.

HANDY HOP-UPS

🖜 o you have a Kyosho GP Spider and you want to compete in a regional event, but you In don't want to spend a bunch of money on hop-up parts. There are certainly parts you could do without and still be very competitive. Many of the parts are trick-looking, but a few simply don't give you much bang for the buck. I've listed what I consider to be the most effective optional parts for the GP Spider. By adding them, you should be competitive with even the most tricked-out GP Spider, even though the competition might look a little better than you as you blow right by!

- Tuned-pipe set and coupler.
- Fuel filter.
- Special main chassis.
- Racing slicks and wheels.
- Front universal-joint drive shafts.
- Ball diffs or steel bevel gears.
- Hard suspension arms.

WEST COAST REGIONAL

Sunday, May 2 (rain date Sunday, May 16) Castle Hobbies Contact: Eric Vasutin 14918 Camden Ave. San Jose, CA 95124 (408) 377-3771

EAST COAST REGIONAL

Saturday, May 22 (rain date Sunday, May 23) Hobbytown USA Contact: Bill Murray 800 E. Barrett Pky. Kennesaw, GA 30144 (770) 426-8800

CANADIAN REGIONAL

Saturday, June 26 (rain date Sunday, June 27) Pinnacle Hobby Contact: Dave Henry 5990 16th Ave. Markham, Ontario, Canada L3P 7R2

MIDWEST REGIONAL

Saturday, July 10 (rain date Sunday, July 11) Hobby Center Clear Lake Contact: Issac Benezra 18177 Gulf Freeway Webster, TX 77598 (281) 488-8697

KYOSHO WORLD CUP

Friday, September 17 to Sunday, September 19 **Hobbietat Raceway** Honolulu, HI (808) 737-9582

THE RULES

World Cup racing is a team event. Each team must have two drivers, and an optional third member is allowed as a pit person. To keep the racing as fair as it can be, the rules do not permit sponsored drivers, anyone who has participated in a previous World Cup final, or any driver who has qualified for the A-main of a ROAR or NORRCA national event in the past two years. During qualifying and Mains, mandatory driver changes at specified intervals allow both drivers equal wheel time. There are two or three qualifying rounds of 10 minutes each, and the Mains last 15 minutes, with the exception of the A-, B- and C-mains. The C-main is 30 minutes, the B-main 45 minutes, and the Amain is a whopping 60 minutes!

The Kyosho GP Spider chassis is the only one permitted, and modifications to the stock dimensions are not allowed. The 4WD system is required to be operational to prevent the use of 2WD conversions where such modifications would be an advantage.

Tires, which can be a significant expense in many other forms of competition, are limited to Kyosho rubber tires. This prevents exotic tire compounds from being a factor in the competition.

As previously stated, the only engines that can be used in World Cup racing are the ones included in the GP Spider car kits-the Kyosho GS-11R and the GS-11X. The engines must remain stock-no modifications. Also, the pullstarter must be intact and operational.

The bodies permitted on the GP Spider include all those currently available or previously offered in one of the kits. To preserve the striking scale appearance of the Kyosho bodies, there are restrictions concerning the location, number and size of holes that can be cut in them. Just in case racers were to shave a little weight from the body by not installing the injection-molded plastic detail parts, Kyosho has that covered, too: bodies must include all of the detail pieces to maintain the proper appearance.

World Cup racing rules may seem restrictive, but they are that way for a reason: to keep the racing as exciting and fair as possible. Once you get past the urge to rip the pull-start off the engine and do some creative porting, you realize that racing is just a lot more fun when you don't spend countless hours and hard-earned money just to stay in the hunt.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

ROBITRONIC

by Steve Pond

KNOWLEDGE IS HORSEPOWER

Pro Master Dv

There seem to be as many theories about the motors we use for R/C racing and what makes them tick as there are racers. Brush cuts, comm size, comm drops, stand-up brushes, laydown brushes, brush-spring tension and other motor-tuning elements all seem to be fair game in the horsepower debate. Ask 100 racers what the best motor is for a given track condition

motor, and you're likely to get 100 vastly different answers.

and how you should set up that

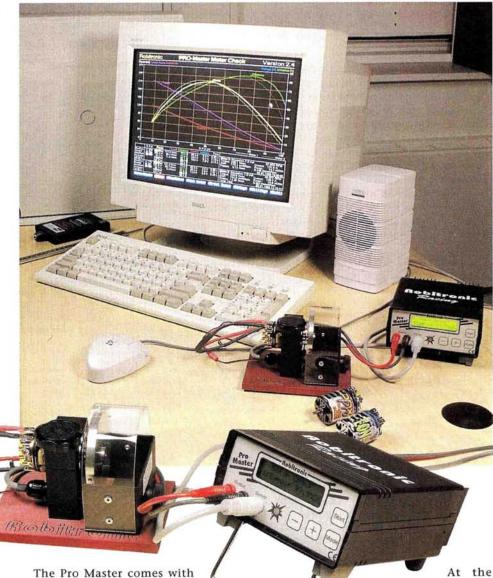
There is the appearance of voodoo-esque tuning secrets that separate the fast from the ballistic on the track. The super-fast always seem to have an insightful sixth sense about motors, and they know just what to do with them to produce the desired results. The fact is there no cookiecutter setup that's going to work on all motors for all tracks all the time. What makes the fast guys fast? A dyno. There are so many other elements that factor into your overall performance, of course; the least important of these is tapping your motor for maximum horsepower; keep in mind that when the rest of your skills are equal to those of your competition, the dyno will make the difference.

At the highest levels of competition, simply knowing the number of turns and the wind configuration of your racing motor isn't enough to get it set up as well as it can be for a given track. That's where a dyno comes in handy. It can give you very precise information about your motor's performance characteristics and can show how changes in timing,

brushes and springs affect its performance.

The new Robitronic Pro Master inertial (flywheel) dyno available from Trinity* is the latest tuning tool in the horsepower wars of racing's élite. It provides more information for finetuning motors than any other available dyno.

It comes in a case for easy transportation, and it includes a motor test stand, a precision flywheel and a processing unit that makes sense of all the data generated during a motor test. A serial cable, serial port adapter and software to interface the Pro Master with an IBM-compatible PC are also included.



The Pro Master comes with almost everything it needs to operate-all except the 12V battery required to power it (a plug-in power supply cannot handle the amp loads it requires). A motor test generates information that's displayed on the LCD panel on the front of the processing unit.

values (power, efficiency, etc.). Use the simple, four-button panel on the front to toggle through the background info that includes average values,

end of a

test, the initial display shows the maximum

GRAPH

Provides up to eight lines of information about the motor being tested. The 3-axis graph can be modified in many ways to tailor the at-a-glance information provided. Benchmark data can be added to the graph to compare motors, or to compare the effect of changes made in the configuration of a single motor.

② MAXIMUM POWER

Indicates the motor's maximum power output in watts. Corresponding information provided includes: the rpm at which the motor produces maximum power, its torque, the current and voltage used at the indicated rpm, efficiency at max power and how long it takes for the motor to accelerate to the point of maximum power.

3 MAXIMUM EFFICIENCY

Indicates, as a percentage, the maximum efficiency of the motor being tested. The corresponding information provided includes the rpm at which the motor runs at maximum efficiency, how much power and torque it develops at the point of maximum efficiency, the current and voltage used at the indicated rpm and how long it takes for the motor to accelerate to the point of maximum efficiency.

ted.

(7) AUXILIARY DATA

Auxiliary data includes the voltage simulated during the motor test, the calculated maximum no-load rpm, torque and current levels at motor start-up, motor EMF in millivolts per 1,000rpm, overall static resistance of the motor measured in milliohms and the static/dynamic friction levels of the bearings and brushes.



(8) BENCHMARK DATA

The broken line indicates benchmark data as a means of comparison. The example shown here indicates a Trinity D3.5 13x2 motor. The broken line indicates the performance of the motor with standard timing as it came out of the box. The solid line, which is the result of the most recent dyno test, shows what happens when the stock timing is advanced by 5 degrees.

(4) MAXIMUM RPM

Indicates the maximum rpm of a motor. The corresponding information provided includes the power and torque developed at maximum rpm, efficiency, current and voltage levels and how long it takes for the motor to accelerate to maximum rpm.

(5) AVERAGE

Average power and efficiency figures over the entire rpm range. When comparing motors, these can be the most useful overall figures.

(6) LIMITED AVERAGE

This provides average power and efficiency between adjustable amperage levels. In this example, the averages shown are between the 20A and 50A levels. This provides yet another "window" for motor-performance analysis.

motor-current table and torque table.

Many of the test parameters may be adjusted, so you can fine-tune the dyno for specific applications. A unique feature is that the voltage supplied to the motor emulates battery-pack voltage: under heavy loads, a Ni-Cd battery's voltage will drop considerably, and this feature allows the Pro Master to provide more usable results.

When connected to a PC, the Pro Master offers additional features and is much easier to use (not that it's difficult to use without one). For starters, almost all of the test information is displayed on the PC screen, so you don't have to toggle through screens to view all of the important info.

With a PC, you'll also be given some extra info; EMF (electromagnetic field), resistance and friction values for the motor are also provided. Additionally, the included software allows benchmark data to be displayed so that two motors may be compared, and the effect of changing one motor's configuration may be assessed. These results are displayed numerically at the bottom of the screen. The main portion of the screen is occupied by a colored graph that can simultaneously display up to eight test parame-

ters. These colorful graphs allow instant, at-a-glance motor evaluation without having to digest hundreds of numbers. Finally, a menu bar at the bottom of the screen allows quick access to the subscreens. These include:

<MotorCheck> is for operating the dyno from the PC instead of from the processing unit and for downloading info from the processing unit (so you don't have to carry a PC to the track to save data);

<File> is for the maintenance of test data;
<ShowData> shows all of the test results
in a table format (in case you're a "number person");

<View Axis> modifies which axis is used to formulate the chart on screen;

<Print Data> allows the printing of table
data, charts, or both;

<Setup> modifies the test parameters and displays results for specific applications;

 Utility> includes a special program for gearing once benchmark data has been established;

<Exit> allows you to leave the program.

In addition to providing the most comprehensive data for motor-performance evaluation, the Pro Master functions as a battery charger. The charging function includes peak-detection circuitry as well as thermal charging capability. The peak voltage drop can be adjusted as can the peak time delay to prevent false peaking early on in the charge cycle. The thermal mode provides adjustment for maximum pack temperature and maximum mAh capacity. The charge rate may be adjusted from 1 to 10 amps for 6 to 7 cells. The charger can store up to five charging profiles, so you don't have to reset all the charger's functions whenever you use a different charging method.

In all, the Pro Master provides the most comprehensive motor-performance-evaluation data. It's a very versatile package that can make the difference when you race at the highest levels of competition. A dyno is a very expensive tuning tool—the Pro Master is no exception—so it may not be for everyone; but if you feel that you have the skills to compete in the big leagues and you're looking for a tool to help you squeeze out a little extra horse-power, the Pro Master should certainly be high on your list of wants.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

Ready-to-Run, by Peter Vieira ready to run

YOU GOT THE BOX OPEN. NOW WHAT?

t one time, assembling a kit was a rite of passage for anyone who wanted to experience the fun and excitement of a "real" R/C car, but with the recent spate of pre-assembled and ready-to-run (RTR) vehicles from HPI, DuraTrax, MRC, Traxxas, Schumacher and others, the time-honored assembly phase of kit ownership is fast becoming optional to the R/C experience. Although the performance and completeness of the new RTR breed are excellent, some jobs are still left undone at the factory. Here's what you need to know to go from package to pavement (or from box to backyard).

BODY TALK

Since most ready-to-run kits don't include a finished body, you'll need to do a little painting and trimming before you hit the track or trail. Doug Mertes, our "R/C Doctor," reveals his best painting tips in this issue, so I'll leave masking and color application to him. I will, however, add this: stick with paints meant for polycar-



Parma's new FasKolor paints are waterbased for easy cleanup and no fumes. Pactra's Racing Finish is the old standby and works great; just make sure you have adequate ventilation when you apply it. When spraying any type of paint, wear a filter mask.

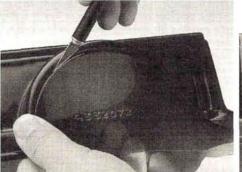
bonate (clear) bodies. Pactra's* Racing Finish line is the industry standard and works great. However, you wouldn't want to spray it in your kitchen; and even in brush-on form, the fumes from its ketone base can be noxious. It is also quite unforgiving of mistakes. A better bet for firsttime painters is water-based paint: Parma's* new FasKolor water-based line

features a wide array of colors.

Once you have the color laid down, it's time to mount the body. A couple inexpensive tools-a tapered ream and a pair of curved-tip body scissors-will make trimming it much easier, and I guarantee you'll reach for them again and again as you enjoy the hobby. The ream is an absolute neces-



A tapered ream and curved-body scissors are musts for trimming bodies. Each costs about 10 bucks. A hobby knife and no. 11 blades are another must-have.





Tighter curves may be difficult to cut, even with body scissors. Try this method instead: score the plastic with a hobby knife, then bend the plastic away from the cut. The plastic pieces will separate cleanly along the scored line.

sity for making precise mounting holes in bodies. A hobby knife can start a hole, but once you try to enlarge a hole past 3mm or so, its circumference will become irregular, and the knife blade will dig into the

plastic. The body scissors are an absolute must for cutting the smooth curves of bumpers and fender wells. DuraTrax*, Kyosho*, Trinity* and Tamiya* all make high-quality pairs.

HOW TO GET YOUR READY-TO-RUN READY TO RUN

CHARGE IT!

In most cases, electric RTR vehicles will require the purchase of a charger and a battery pack. If you're on a tight budget, AC/DC timed chargers work just fine and are very convenient, but you should understand that a 15-minute charge is not a full charge. Most 1500 and 1700mAh packs require 30 minutes or more on a timed charger to reach full capacity. To make sure your packs get fully juiced without being over-charged, set the timer for an extra 10 minutes after the first 15-minute charge, then feel the pack; if it's warm to the touch, it is fully charged. If it isn't, dial in another 5 minutes on the charger and repeat as necessary until the pack is warm; that's toasty warm—not hot! For a little more money, MRC's* Super Brain and Hobby Shack's* Einstein chargers offer peak-detection circuitry instead of a timer to automatically stop charging when the peak charge has been reached.

When you've started to run your freshly charged pack, you should not recharge it until it has been fully depleted; don't run the car for five minutes and then "top off" the battery. Racers use discharge bulbs or other discharge devices to fully deplete their batteries after a run, but you needn't worry about that kind of discharging. Simply running your vehicle until the battery can no longer propel it is enough. Let the pack cool before you recharge it, and follow the instructions given above.

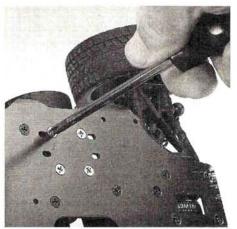


MRC's Hammerhead RTR is available complete with battery and Super Brain peak charger. The Super Brain is also sold separately and costs only a little more than a timed charger.

STAY GLUED

NITRO KNOW-HOW

Before the car's first run, and periodically thereafter, check all fasteners for tightness, especially the engine-mounting



Check all fasteners for tightness, especially engine-mounting screws or bolts. It's a safe bet that any fasteners that have been tightened into metal parts will loosen due to engine vibration. Lock 'em up!

screws. They're likely to loosen, so threadlocking compound is a must. Remove one screw to see if it has thread-lock on it (a colored substance on the threads). If there isn't any, apply some now. Blue Loctite* works best. Remove and reinstall each screw one at a time to avoid disturbing the mesh of the clutch bell and spur gear.

Nitro- or "gas"-powered vehicles require a little extra care when running, particularly during the first few tanks of fuel. Be sure to break in the engine properly following the manufacturer's guidelines. You should not, under any circumstances, rev the engine up to full throttle then tear up and down the street on the very first tankful. No matter what you do, run the engine "rich" for the first four tanks (at least), allow the engine to cool between runs, and avoid prolonged fullthrottle operation. Your kit's instructions will be much more detailed. Follow them!

Nitro engines also require a steady flow of cooling air to prevent them from overheating. A large hole in the windshield and another in the rear window on the engine side of the vehicle will do the job well. You may also find that removing a side window will allow you to access the



Nitro engines require plenty of cooling air to operate properly. The hole in the windshield, along with another in the rear window, permits air to circulate through the body to cool the engine.

fuel tank without removing the body. This allows quick fuel stops, and it allows more fresh air to circulate around the engine. The cooler the better!

Few hobby-level R/C cars offer performance so mild that tire glue is not required; most will quickly roll the tires off their rims if cyanoacrylate cement (CA) is not used. This type of glue is generically referred to as "super" or "crazy" glue, but you should stay away from the tube-type glues you see in hardware stores and stick (literally) with "thin" CAs from the hobby store. Pro-Line's* cement is popular, and Trinity's Tyre Fix also works well.

When applying CA, remember that a little goes a long way. A few drops spread around the rim are plenty. Gently flex the



A little CA goes a long way. Work slowly, and keep paper towels handy to dab away any errant drops of glue.

tire's sidewall as you turn the wheel, using gravity to help distribute the CA, then allow the wheel to sit for a few minutes before you flip them to glue the opposite side.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

ABOUT BATTERIES

When buying AA batteries for your transmitter (and receiver pack, if you own a gas-car), skip the bargain-price "heavy-duty" batteries and get alkaline cells. "Heavy-duty" batteries are anything but; they don't last nearly as long as alkalines. For the ultimate in long life, get rechargeable Ni-Cd cells. Although more expensive "up front," rechargeables will pay for themselves (pretty quickly, too, if you run your car or truck often—or leave your radio on!). Ni-Cds have slightly lower voltage than alkalines, however; a Ni-Cd puts out 1.2 volts; an alkaline cell, 1.5 volts. Although their lower voltage is not usually a problem for the transmitter, using Ni-Cds in the AA battery-box of a nitro car can diminish the responsiveness of the servos. For that reason, most nitro enthusiasts who choose Ni-Cds for their receiver packs use 5-cell packs instead of 4-cell packs.

Need to know

what's new? What works well and what doesn't? This section is devoted to objective reviews of all R/C car accessory items. From gears and wrenches to motor brushes and shock springs; if you can use it with your R/C vehicle, you'll find it critiqued on these pages.



190 Niftech Oval Car Hop-Ups



Novak Reactor Reversible ESC



Lighthouse Video **Productions** "IFMAR Ontrack '98 Worlds" Video

NIFTECH Oval Car Hop-Ups Are they the best?

ou have to give the crew at Niftech* credit for confidence; check out what's printed on their packaging: "It's Niftech! It's the best!" With a slogan like that, they had better make some great

stuff. After trying the gear myself, I'm pleased to report they do.

To get ready for some oval racing at S&K Raceway in Johnston, RI, I decided to build up an Associated RC1oL3O with some Niftech goodies, including the company's Super Graphite Axle, Rocket Rings, Precision-machined diff- and left-side hubs and

Precision bronze pivot balls. Here's the scoop on the parts.

• Precision bronze pivot balls. These are a welcome upgrade to Associated's Dynamic Strut front end. The bronze balls replace the stock plastic pieces, and it's easy to see (and feel) the advantages of the Niftech parts; their polished finish allows them to operate very smoothly, and their tighter tolerances eliminate slop. They are also much harder than plastic and will probably outlast the car. The tighter fit and

lack of "give," however, make the bronze balls more difficult to install; I recommend Niftech's no. 3200 pivot-ball installation and extraction tool; it really helps (you can use it with the stock balls, too).

· Super Graphite Axle. This is a superior piece of equipment, both in performance and convenience. No one enjoys pinning a diff, so Niftech pins the diff flange for you-nice touch. It's not just any ol' pin, either; a steel roll pin is used, so you know it won't sheer or flex. The diff flange is also super-true (Niftech claims 0.0002-inch tolerance) because it is machined after it has been

joined to the axle. Finally, the axle's 7075 (that means it's super-strong) threaded-aluminum tip is not just an insert but is actually a solid rod that extends all the way to the end of the hollow-graphite axle tube. The complete package is very stiff, weighs 11 grams and should stay true under all conditions; any force strong enough to bend it would probably total the car. As a bonus, Niftech includes its "Bearing Saver" 0.031-inch shims with the axle. These plastic shims cushion the axle bearings when they're subjected to side loads (like when I drift high and smack the boards broadside).

· Precision-machined diff- and left-side hubs. Niftech's 8gram diff hub is the perfect complement to its axle. It is also pre-pinned and includes heavy-duty "thermo-forged" steel mounting screws for the wheel. The hub is sensibly machined to minimize weight without compromising

Below: clockwise from upper left: Precision-machined diff hub; Super Graphite Axle; bearing savers; Precision bronze pivot balls; Rocket Rings.



strength; after all, light and broken is never a fast combo.

The left-side hub weighs in at 6 grams and shows Niftech's rebel spirit: while everybody else makes clamping hubs, Niftech sticks with a setscrew design. Before you get visions of marred axles, consider this: Niftech grinds the tip of the setscrew flat so there's no "cookie cutter" lip. I have to admit I was still skeptical and even a little leery of crimping down the setscrew on that sweet Niftech axle. I had no reason to be concerned; the hub didn't budge, and the setscrew

> left only a faint scuff on the axle. Design-wise, the left hub matches the diff-side unit with a form-follows-function look and natural aluminum finish.

> · Rocket Rings. A picture tells the story: one look at the unique Rocket Rings and you know they must be light, and at 1.5 grams each, they are. They feature a fine "micro finish" and a claimed hardness of 6oRc for smooth action. Niftech includes its no. 2003 diff balls with the rings, which are also 6oRc hardness; the matched hardness prevents the diff balls from brinelling the rings and prevents the rings from flattening the diff balls. I assembled the Niftech diff hub, axle,

and Rocket Rings with no. 2002-DL Rocket Ring Diff Lube, and the diff action was incredibly smooth; I couldn't believe the diff was tight! Furthermore, the completed axle assembly showed no runout; my freshly trued tires looked as if they were standing still on the spinning axle.

So, if it's Niftech, is it the best? I can't say I've tested everything out there, but if Niftech's stuff isn't the best, then the stuff that is must be pretty amazing. All the items discussed here are first rate in fit and finish. Although the lack of color options and the purely functional styling may not appeal to the fashion set, and these aren't inexpensive parts, serious racers (or anyone who appreciates top-shelf equipment) will recognize the Niftech components as real racing gear from real racers for real racers.

-Peter Vieira

LIKES

- · Conservative, no-gimmicks designs.
- Precision construction; high-quality materials.

DISLIKES

· No color options.



NOVAK Reactor reversible ESC Fun in an orange box

t's an irrefutable fact: electronic speed controls (ESCs) are now more efficient, affordable and easier to operate than ever before. Naturally, ESCs outperform any mechanical speed controls; more impressive is that today's ESCs easily surpass the capabilities of units that were on the market

just a year or two ago. Novak's* new Reactor is a perfect example of how refined the modern ESC has become; with its simple setup and clever built-in features that ensure the survival of both the ESC and your car's transmission, it's a tough package to beat. Check it out.

FEATURES

Smart Braking. The Reactor allows full braking control as well as proportional reverse, thanks to the Smart Braking system. Simply put, the Reactor will not allow reverse to engage until it senses that the motor has slowed to a safe speed. Until that low speed (a slow crawl) is

reached, reverse trigger throw delivers proportional braking. This allows far greater control when slowing for turns, and it spares the gearbox from the devastating abuse of transitioning from full-throttle forward operation directly to reverse operation. However, Smart Braking does not work when transitioning from reverse to forward operation; if you want to do wheelies by dumping full throttle while the car is cranked up in reverse, you can, but the wear and tear on the tranny will be your fault!

Reverse-Disable Circuitry. Wanna race? The Reactor is easily programmed for forward-only operation, if you're bitten by the competition bug.

One-touch Setup®. It seems that all but the most inexpensive ESCs now have some type of push-button setup, but I don't consider myself spoiled yet; I'm still impressed by how easy it is to set up an ESC, and that includes the Reactor. Push button. Squeeze trigger. That's about all there is to it.

SPECIFICATIONS

Input voltage—6 to 7 cells.

On-resistance (forward)—0.004 ohm.

Rated current*—160 amps.

Braking/reverse current—80 amps.

BEC volts/amps—5.0/0.5.

PWM frequency (nominal)—1000Hz.

Battery/motor-wire gauge—16.

List price—\$165.

*Transistor's rating at 25 degrees C junction temperature

Polar-Drive Technology. Novak chose the chilly name to reflect the cool-running capability of the Reactor and the other Polar Drive-equipped ESCs in the Novak line. The stuff works; the partial-throttle abuse that used to make an ESC hot enough to brand cattle

barely warms the Reactor.



Other features include: Novak's toughest Hyperfet III transistors; Temperature Overload Protection circuitry, which will shut down the Reactor if it overheats (what is this, "The China Syndrome"?); "bullet" motor connectors (complete with ready-to-solder female leads if your motor is not already equipped to accept bullet connectors) and Tamiya-type battery plug; a selection of receiver plugs for use with all popular radio systems; purpleanodized heat sinks; mounting tape; zip-ties; and capacitors. There's a set of decals in the box, too.

Likes

- Set-it-and-forget-it reliability.
- Solderless installation.
- Smart Braking really works and offers precise brake control.

Dislikes

 I really don't have any. In the interest of editorial balance, however, I will complain bitterly that the included decal sheet clashed with my test vehicle's paint scheme.

PERFORMANCE

If you use the supplied connectors and already have the correct capacitors on your motor, you can skip soldering and have the Reactor installed in five minutes; just plug and play. Once installed, the Reactor works as promised, which means you can forget about it and simply enjoy driving. I ran a bunch of packs through my Reactor-equipped Tamiya Baja Champ for the "Thrash Test" in this issue, and the little orange box never blinked. I spent a lot of time crawling around with the car at partial throttle, but the Reactor only warmed slightly; I guess the Thermal-Overload Protection will have to go untested! Throttle response felt smooth and linear in forward and reverse, and the Smart Braking proved effective-no surprise, really. Novak's reputation for quality was justly earned, and the Reactor is another intelligently engineered product that will keep that rep in good standing.

-Peter Vieira



LIGHTHOUSE VIDEO PRODUCTIONS "IFMAR Ontrack '98 Worlds" Video

Spashett sweeps the Worlds-in your living room

ou like to watch auto racing on televisionright? Of course you do. You know that aerial shot they use?-the one from the blimp? Imagine if you had to watch the whole race that way: just little dots whirling around a track. No different camera angles, no cuts, nothin'. Sounds pretty lame, huh? Unfortunately, that's just the sort of view most R/C racing videos offer. R/C racing simply doesn't translate well to video; the cars are just too small and too fast, and the action often gets too strung out to follow-at least, that used to be the case.

Available from Trinity*, the "IFMAR Ontrack '98 Worlds" video, which presents the 1998 IFMAR World Championships for 1/12-scale on-road, touring car and 1/10 on-road, is different, and it's arguably the best R/C racing video ever. So, aside from capturing the most impressive Worlds' showing ever, what makes it so good?

Most important, the production values of this British effort are excellent. This is no home video piece with inexplicable zooming and long meaningless shots of nothing; it's strictly professional all the way. The action is shot at a low angle, which better captures the speed of the cars, and the camera pans to follow the speeding racers-far more dramatic than the ol' bird's-eye view.

Audio is just as important to the viewing experience as the visuals, and this video doesn't disappoint: whether it's race announcer Chris Kennedy's blow-by-blow captured on tape or the voice-over supplied by John Chevne, the nearly constant narration keeps you informed. Instant replays of key moments in each race further illuminate the action, and on-screen titles identify cars and drivers.

I also like the tape for what it doesn't show—that is, every minute of every heat. Even if you're a diehard race fan, there's only so much track action you can take. All

Radio Controlled Car S 1:12 On Roa :10 International Sca ouring Cars World Cup Pro Ten Championships

LIKES

- Professional production values.
- You've read about them; now see R/C's stars and personalities in action!

DISLIKES

 Crummy box design won't attract newcomers.

the important moments are there; all the look-alike laps without position changes among the leaders are not. The tape covers all three "B" and "A" finals for the 1/12-scale event, the most significant heats in International Scale Touring Car (want to see Joel Johnson, David Spashett and Masami Hirosaka duking it out? Here ya go.) and the "A" final for Pro 10. Each segment is introduced by a montage of smooth passes and horrific crashes.

> There's more to the "Ontrack '98 Worlds" video than race action. Notable racers (David Spashett, Josh Cyrul, Joel Johnson and others) and industry personalities (Ernie Provetti, Shawn Ireland and Gil Losi Jr.) are interviewed briefly but insightfully. The tape's hosts provide enough background information on R/C racing to avoid confusing first-time race viewers without insulting the intelligence of longtime racers.

> > There's also a track walk-around with

David Spashett, a tour of the facility where the race was held and bios of the drivers as they take the drivers' stand. This video is 90 minutes of high-quality R/C coverage that you can confidently show to anyone as a representation of how fast and exciting R/C racing can be. It's also a good companion piece to Trinity's excellent video coverage of the 1997 Off-road Worlds, if you're looking for the best in on- and off-road R/C viewing.

The only real downside to the tape is its box, which has all the pizzazz of a fire-safety video. It won't affect your enjoyment of the tape, but the plain-Jane box won't draw any newcomers in either. That's a shame, because anyone who watches it will feel a burning desire to try R/C for himself. If I had a hobby shop, I would run this video on a continuous loop. It's good stuff. -Peter Vieira

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www.rccaraction.com

It gives you instant access to the very latest scoops in the R/C world! Plus-find out what's coming in the next issue.

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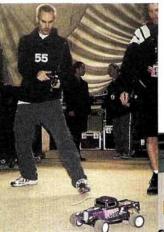
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<u>C</u>hris'ş

The opinions expressed on this page do not necessarily represent the opinions of the entire Car Action staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographsanything you like-to Chris's Back Lot, c/o R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. My email address is: chrisc@airage.com.

BY CHRIS CHIANELLI

I want my I want my Ham-mer-head



here are many ways to unwind after a night of high-energy rockin'-some good, some not so good. Rollin' with R/C cars is how some of the guys



band Third Eye Blind do it. Here are some shots of the guys from the band doing a bit of backstage truck bashing with MRC's Hammerhead and Ironman. Since time and permanent workshop space are scarce when on tour, ready to run is the way to go when constantly on the go.

These photos are from a shoot for an upcoming MTV special on the band-I guess for the segment called, "What the guys do when not playing." Or maybe the segment will be called, "How's it gonna R/C" or "Semi-charged pack" ... or maybe not.

Call up MTV; tell them, "I want my Hammerhead."

Above: Brad Hargreaves' driving style includes "body English." Of course, the drummer gets the Hammerhead. Right: Singer Stephan Jenkins gets the Ironman while bass player Arion Salazar wonders whether the truck he's going to drive will have a semi-charged pack by the time his turn comes.

My name is Robert Lindemann. I've been a subscriber for roughly 10 years. I live in Pigeon Forge, TN. In this area, it seems to me that the primary R/C interest is in oval/pan-style racing. My interest is either sedans or off-road, specifically 4WD. To my knowledge, there are no off-road tracks close by, and though there are plenty of parking lots available for sedan racing or bashing, I don't know of other people to run with or against.

If you could publish this email along with my address, I'd love to hear from anybody in this area who'd like to get together for some R/C fun.

Robert Lindemann 3152 Parkway, Ste. 13-102 Pigeon Forge, TN 37863 (423) 429-8712

Robert:

Thanks for the idea Robert. Because of you, we're going to start a new section on our website (www.rccaraction.com) for racers in search of other racers. It will be called "Racer Search" and will be for anyone looking to hook up with other racers in their area. Truly a great idea. In fact, I like the idea so much I'm sending you a free 1-year subscription to Car Action. How do you

Good luck in your search, and have fun.

www.rccaction.com





The wellworn program from the '98 tour.